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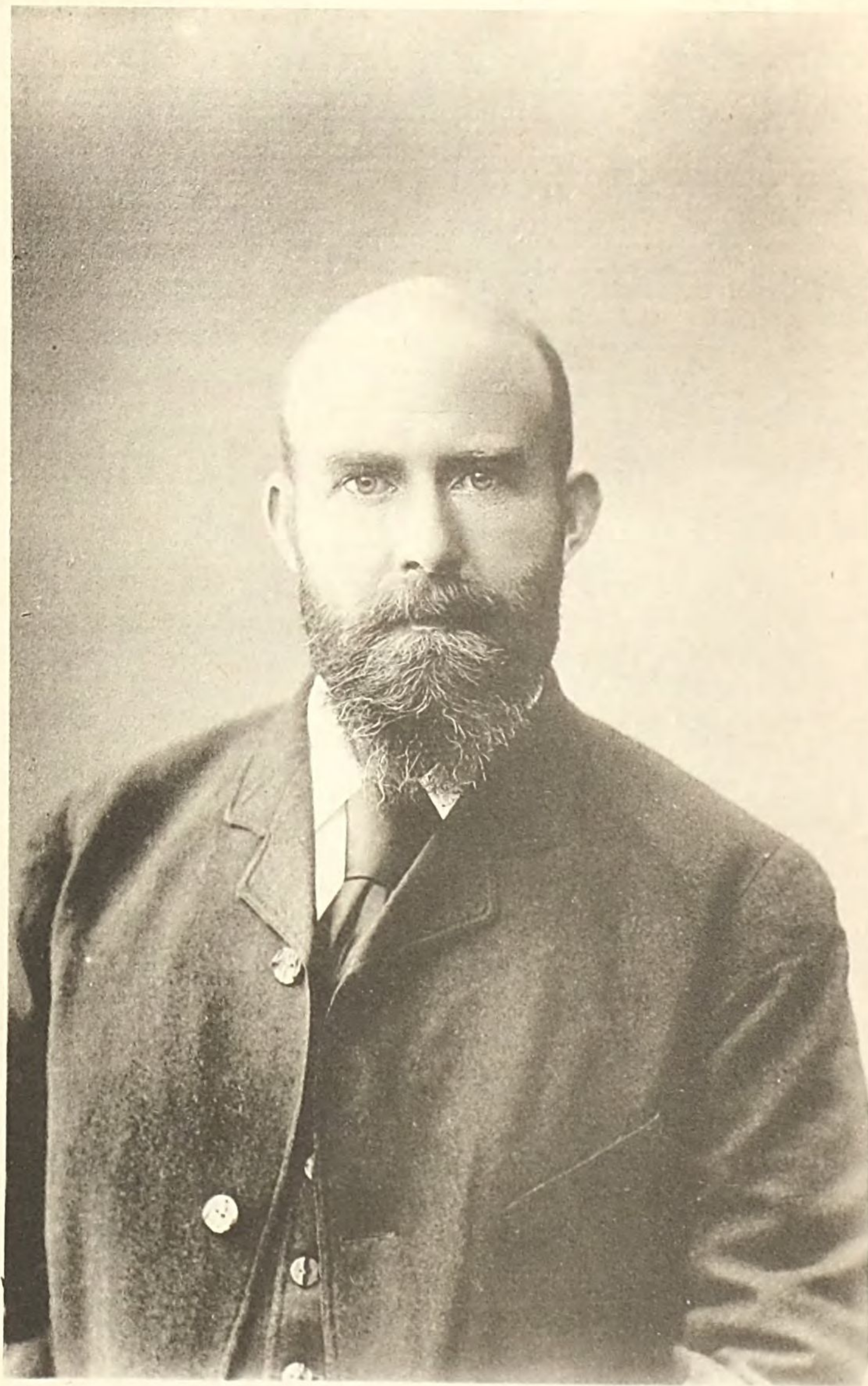
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BRITISH NEW GUINEA.



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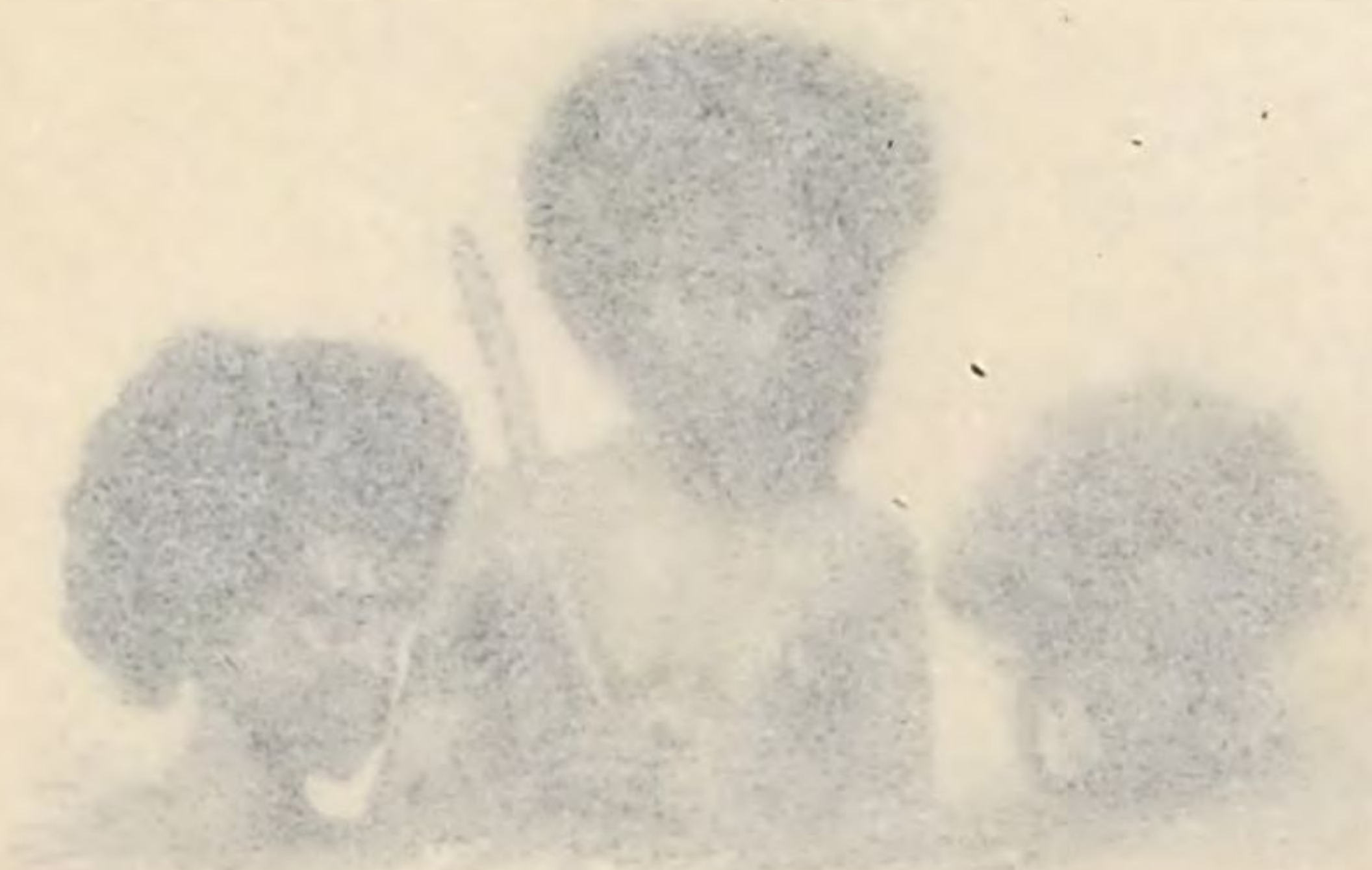
Administrator of British New Guinea.

From a Photograph by Poul C. Poulsen, Brisbane.

BRITISH NEW GUINEA. 10

J. P. THE HON. JAMES R.

Honorary Secretary of the British New Guinea Association, London
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NEW GUINEA NATIVES.

With Map, numerous Illustrations, and Appendix.

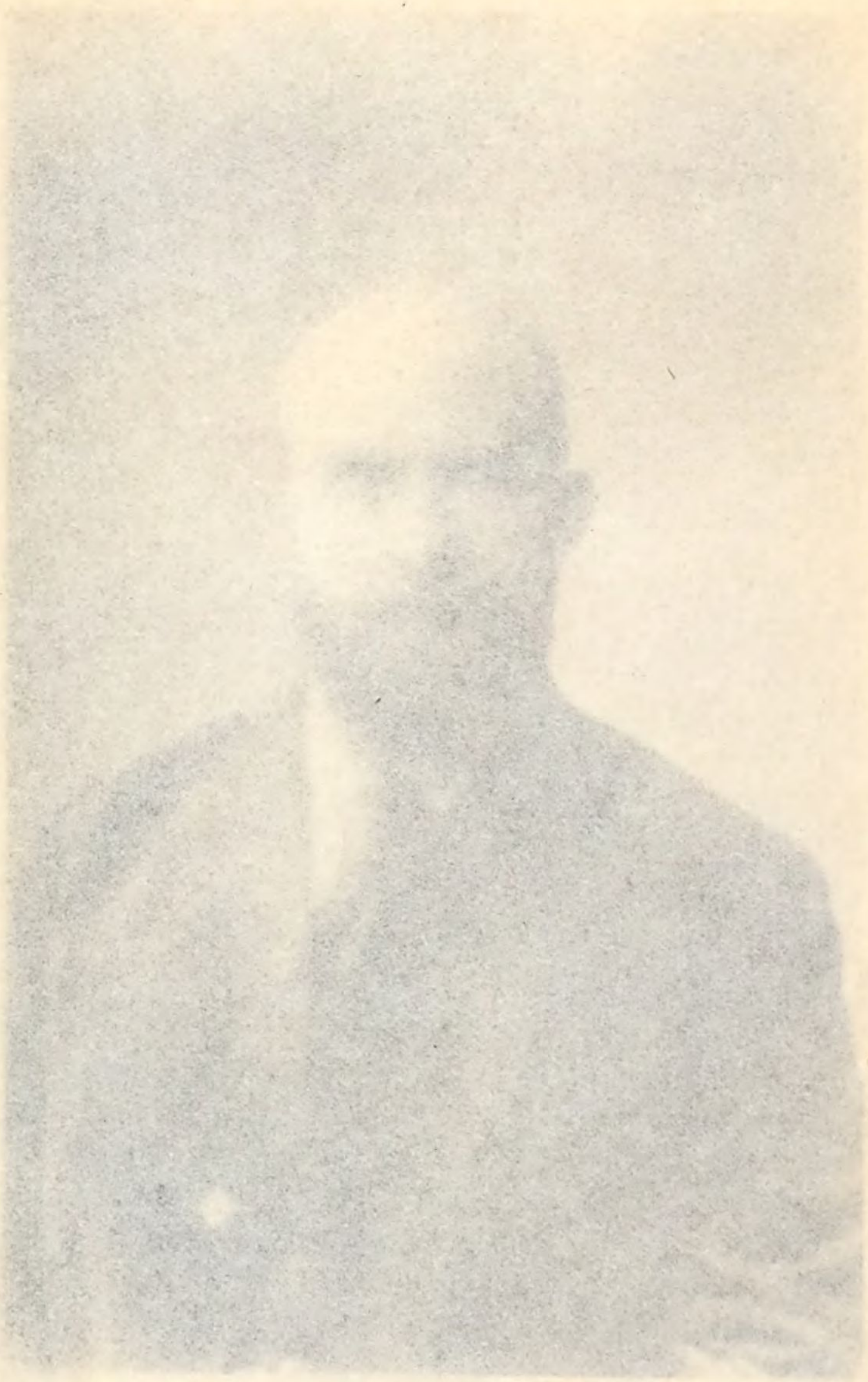
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MR. WILLIAM MACGREGOR, K.C.M.G., M.D.

Legation of British New Guinea.

Printed by the Government Printer, Sydney.

BRITISH NEW GUINEA. *80*

BY

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Geographical Society; the Manchester Geographical Society; and
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MÜNCHEN

To

SIR WILLIAM MACGREGOR, K.C.M.G., M.D.,

Administrator of British New Guinea,

*Whose brilliant achievements in the field of Exploration and Discovery in
Papua have engendered universal admiration;*

To

THE HONOURABLE SIR S. W. GRIFFITH, K.C.M.G., M.P., &c.,

Premier and Chief Secretary of the Colony of Queensland;

President of the Royal Geographical Society of Australasia (Queensland Branch);

*A distinguished Statesman signally associated with the foundation of
British New Guinea;*

And to

BARON SIR FERD. VON MUELLER, K.C.M.G., F.R.G.S., &c.,

President of the Royal Geographical Society of Australasia (Victorian Branch);

*A distinguished Geographer, upon whose recommendation attention
was first directed to the Alpine Zones of Papua,*

THIS WORK

is, by special permission, most respectfully inscribed by

THE AUTHOR.

P R E F A C E.

DURING the past six or seven years numerous papers on subjects connected with New Guinea have been contributed by the writer to the geographical societies of Australasia, England, Scotland, and France. These, however, are dispersed, and available only to geographers, and to the limited number of readers of the purely geographical literature published by those institutions.

Since 1883, when the British flag was for the first time unfurled on the Papuan shores by the Colonial Government of Queensland, many discoveries have been made, and explorations conducted, under its auspices. Goldfields have been opened up, Christianising missions have been established, a Government has been founded, and various other forms of civilised life inaugurated for the peaceful occupation of the country, the development of its natural resources, and the amelioration of the condition of its wild and heathen inhabitants. These successful conquests in the cause of science and humanity, accomplished by the judicious and enlightened enterprise of a cultured and Christian people, redound to the credit and renown of the British race; whilst the early struggles and heroic achievements of the brave and self-sacrificing pioneers in our Papuan Possession merit reward, and receive universal admiration.

Juvenile though it be, British New Guinea, even now, occupies a place in the literature of our nation. Books of adventure narrate remarkable phases of life in hostile and friendly regions, some even transforming peaceful communities to eaters of human flesh; whilst

others, of a somewhat less sensational character, magnify discovery and distort the natural features of the country.

In submitting this modest contribution to the British reader, the author desires it to be distinctly understood that his chief aim, in undertaking its preparation, was a desire to place before his numerous and distinguished co-workers in the department of geographical science an authentic record of our knowledge of Her Majesty's youngest colonial possession. In accomplishing this labour of love, many discouraging drawbacks were met with, and not a few obstacles encountered. In the first instance, the whole MS. and valuable illustrations, entrusted to the care of a friend, were lost in the ill-fated *Quetta*. This necessitated the re-writing of the whole and the re-preparation of illustrations, all of which could be done only during hours of leisure, and not infrequently associated with family sickness and anxious hours of weary care. Consequently the sympathy and indulgence of readers are solicited.

From prolonged professional experience in Fiji as a fellow-officer of the distinguished Administrator of British New Guinea, in the capacity of a Government surveyor and explorer, and in other parts of the Western Pacific and Australasia, the writer can deal with the physical and broad geographical aspects of his subject in, what appears to him, a manner likely to be of use to those requiring trustworthy information upon our Papuan Possession. Likewise, his intimate acquaintance with Polynesians and other coloured races has enabled him, in describing the people, to picture truly the various scenes and phases of Papuan life.

Most of the material used consists of the results of the extensive and detailed investigations of Sir William MacGregor, conducted in connection with his administrative duties. For other data the archives of the Royal Geographical Society of Australasia have been consulted.

In undertaking this work, the author was particularly anxious to produce a volume on somewhat different lines from the ordinary

narrative of travel—something of a representative character—that may be welcome to students of natural science. With that object in view, the writer sought and was fortunate in obtaining the co-operation of workers eminent in their special departments of knowledge.

The contributions of these friends, respecting Geology, Flora, Fauna, and Languages, constitute a copious Appendix that cannot fail to add greatly to the value of the work.

For cheerful and willing aid, the author is proud to acknowledge with gratitude the services of one upon whom he is privileged to bestow no nobler title than that of Wife. Dr. Hugh Robert Mill, then Convener of the Correspondence Committee of the Royal Scottish Geographical Society, undertook the revision of the proof-sheets, with the exception of the Appendix, which has been revised by Dr. Bowdler Sharpe of the Natural History Museum, South Kensington. The Author's best thanks are also due to Captain J. L. Michael, late Commander of the London Mission Society's Yacht *Harrier*, for a number of excellent photographs taken by him in various parts of New Guinea; and to the proprietors of the *Sydney Illustrated News* for permission to reproduce some of their illustrations. The obligations of the writer are also cheerfully acknowledged to his distinguished collaborators, especially Baron Sir Ferd. von Mueller, Government Botanist of Victoria; Messrs. C. W. De Vis, Curator, and Henry Tryon, Assistant Curator of the Queensland Museum; Charles Hedley, of the Australian Museum; Robert Etheridge, jun., Palæontologist to the Geological Survey of New South Wales; and to Professor A. Liversidge, of the Sydney University, for their valuable contributions to the Appendix of this work.

J. P. THOMSON.

BRISBANE, 1892.

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(*From Photographs by Mr. H. BARNES.*)

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MAP OF NEW GUINEA	<i>At end</i>
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BRITISH NEW GUINEA.

CHAPTER I.

HISTORICAL SKETCH.

"It appears to me a noble employment to rescue from oblivion those who deserve to be eternally remembered, and by extending the reputation of others, to advance at the same time our own."—PLINIUS *Minor*.

OF whatsoever nature an undertaking may be, begin at the beginning. Acting upon this axiomatical principle, it may, perhaps, be useful to furnish a somewhat brief sketch of the historical aspects of the whole of the great Papuan land, its superficial dimensions, national geographical divisions, British territorial limits, and the voyages of discovery and explorations preceding the more recent operations of the first Administrator of the newly created British territory. From incomplete geographical delineations of its perimeter, we assume the approximate superficial area of New Guinea to exceed 340,700 square miles. It is about 1500 miles in length by about 500 miles across its greatest breadth; it is physically divided by two known great mountain chains, which terminate in the wild, mysterious alpine zones of the Charles Louis Cordillera of the west, whose snowy crown reflects a perpetual lustre, and the frosty regions of Mount Victoria in the east.

With the superficial knowledge we possess of Portuguese and Malayan early history, any attempt to assign date and particulars of the discovery of New Guinea must be purely of a presumptive character. We can produce no sound premises, but our prolific

assumptive boldness announces the discovery of New Guinea to have been effected between the years 1512 and 1528; the honour, in so far as our imperfect knowledge extends, being divided between a Spanish sailor, Alvaro de Saavedra, who described its bold outlines in 1528, and some unknown Portuguese by whose knowledge particulars of its existence had been obtained about the year 1512.

Apart from the modifying influence of climate upon the race, the modern Papuan ethnological data indicate the early transfusion of Chinese and Malayan blood in the veins of many known tribes of New Guinea, which, combined with other evidence, lead us to assume that New Guinea was probably known to the Malays and Chinese at a much earlier period than that indicated. No definite information can be obtained concerning this early period.

Of European navigators, we are confronted with the namesake of the great straits separating the Australian continent from the Papuan shores, Luis Vaz de Torres, who saw New Guinea in 1606. The south-west shores were next observed by the Dutch sailors Schouten and Lemaire in 1676, who were followed in 1768 by the celebrated French navigator, De Bougainville, and by the illustrious English circumnavigator, Captain Cook, in 1770. The shores of the great island were subsequently viewed by Forrest in 1774, by Edwards and by Captain Bligh of the *Bounty* in 1791, also by Captain Flinders in 1799. Dumont d'Urville, who made a voyage to the east coast of the Papuan land about the beginning of the current century, furnished us with the first knowledge of the internal conditions of Papuan life and natural history. Several parties were landed by him to examine the unknown shores of the island, and copious zoological collections were made by the naturalists attached to his expedition, whose reports on Papuan natural history were most interesting and instructive.

The penetrating sunlight of civilisation had now commenced to tinge the fringes of the opaque curtain which for ages had enshrouded this great heathen land, and in the march of empire

our Dutch neighbours of the Malayan regions were not the least conspicuous. In 1825 and 1826 the Dutch, who had annexed that section of New Guinea west of the 141st meridian of east longitude, being anxious to obtain information upon its natural and potential capabilities, despatched the man-of-war *Dourga*, commanded by Lieutenant Kolff, who examined the south-west coast. He discovered several features and supposed rivers, which were subsequently found by the *Postillion* Expedition in 1853 to be the straits separating an island from the mainland. The shores of this island, which was named after Prince Frederick Henry, were low and almost unapproachable, owing to the shallowness of the coastal waters, the extensive mud flats, and the density of the mangroves. The mouths of many large streams were discovered in the neighbourhood of the Dourga Straits and the Outernata River; but, as already described, the physical conditions of the coast rendered communication with the natives and an examination of the country impracticable. The natives were warlike, and evinced hostile demonstrations. These operations were closely followed by the *Trinton* Expedition, which, in 1828, navigated the south-west coastal waters and examined Trinton Bay and the Outernata River. Consecutive to these national undertakings, the expeditions of the *Siren* in 1832, and the *Trinton* again in 1835, which completed the preliminary survey undertaken by Lieutenant Kolff, examined Nautilus Straits, Adi Island, and several places of the Papuan west coast line. These expeditions were followed up, after an interval of twenty-three years, by the Dutch war steamship *Etna*, which ascended the Karoefa River, whose basin was clothed with the most luxuriant vegetation. Dutch expeditions were subsequently despatched to the Bay of Caimans, Humboldt Bay, and Etna Bay. The scientific expeditions of Van der Crab in 1871; that of Dr. A. B. Meyer in 1873; Langeweldt, Correngeel, Teysman, Swain, Hemert, in 1876, and others of less renown, characterise Dutch energy and enterprise in New Guinea. These operations have, however, been almost entirely concentrated

in the examination of coastal configuration, more especially the marine conditions, as affecting maritime enterprise. These supply us with little more knowledge of the interior than we possess of the physical features of the planet Mars; indeed, the interior of Dutch New Guinea is truly a *terra incognita*, its condition being possibly the least known on the face of our globe.

While Dutch expeditions were scanning Western New Guinea shores those of other nations were penetrating, with curious eyes, the dark recesses of the east. Thus we find that in 1842-46, H.M.S. *Fly*, of the British navy, engaged upon a marine survey expedition, discovered and named the Fly and the Aird Rivers, and examined part of the south-east coast. This survey, which was continued by H.M.S. *Rattlesnake* in 1846-50, however, did nothing more than examine the coast-line. Missionary influence now appears to have shed the first rays of Gospel light upon the eastern horizon of this dark island, inhabited by a wild, turbulent people. We find the Rev. J. Chalmers and Mr. Chester in 1867 visiting its south-east shores; and subsequently the same part of the coast was navigated by the missionaries in the *Ellengowan*, who renamed the previously discovered Mai Kussa River the "Baxter."

After the lapse of a few years the British navy was again marshalled in the field of pioneering enterprise, this time under the command of the gallant and distinguished Captain Moresby, who in 1871 and 1876 made complete surveys of, and explored the east and south-east coasts of, New Guinea. Anchoring in Redscar Bay, he examined the surrounding country, explored the Usborne and Edith Rivers, visited Hall Sound and Yule Island, discovered Port Moresby, surveyed Milne Bay, examined and named Discovery Bay, and further extended his surveys to Astrolabe Bay, the aspect of which he described as beautiful. He minutely observed the characteristics of the natives at the places visited, and gave an interesting and instructive description of them and the aspect of the country they inhabited.

Although visited by many expeditions, it is to the unflagging

energy and enthusiasm of the distinguished naturalist Wallace we are indebted for a large share of the knowledge we possess of the northern coasts of New Guinea.

Natural science was also ably represented in 1872 by D'Albertis, who, with Beccari, visited Salwattee Island and many other places along the north-western shores of New Guinea. The country he described as beautiful, covered with luxuriant vegetation, dense forests, and inhabited by a large population of hostile natives, whose Mohammedan faith rendered their natural cannibal propensities and revengeful natures more obtrusive and dangerously treacherous than they might otherwise have been, as unsophisticated children of nature.

Leaving it for a short space of time, D'Albertis in 1875 again visited the shores of New Guinea, where he entered and proceeded up the Mai Kussa River to the head of its navigation. In December of the same year he entered and navigated the Fly River to Ellen-gowan Island. In 1876 and 1877 this enthusiastic Italian naturalist again visited the shores of New Guinea, first at Yule Island and Hall Sound, where he explored the Ethel River for natural history specimens; he then proceeded to and ascended the Fly River for a distance of 464 miles. On these expeditions he discovered one of the tributaries of the Fly, named the Alice River. The natives he found very hostile along the banks of the Fly, and the tribes inhabiting the interior were of real Papuan type. Our knowledge of the natural history of the country was greatly enriched by these expeditions.

In 1876 we find New Guinea also visited by the French scientist, M. Raffray, and by the Hon. William Macleay's *Chevert* Expedition. Although obtained from previously known places, the results of the latter expedition were highly satisfactory to naturalists. These operations were closely followed up in 1877 by the trustees of the Australian Museum, who despatched Mr. A. Morton in company with Mr. Goldie, a botanical collector, to the shores of New Guinea. Calling at Port Moresby, they proceeded to Redscar Bay, and discovered a new tributary to the Laroki River, which was named

the River Goldie. The bed of this river and its tributaries were prospected by Mr. Morton, and yielded traces of gold.

We now reach an interesting period in the history of New Guinean exploration, rendered famous by the self-denial and untiring enthusiasm of that accomplished Russian naturalist, M. de Miklouho-Maclay. Landing on the inhospitable and hostile eastern coast in 1871, he extended his operations over 200 miles of its shores. After devoting a period of about eight years to the explorations of Astrolabe Bay and other sections of its northern coast, he visited the southern shores of New Guinea in 1879-81, and investigated the conditions of its inhabitants. The results of the ethnological, ethnographical, and zoological researches of this enthusiastic scientist in the sea-board of New Guinea furnish most valuable accessions to geographical science.

Representatives of the London Missionary Society in 1879 visited a section of the country north of Port Moresby; and in August of the following year an excursion was also made in the neighbourhood of Redscar Bay. They have likewise, on several occasions, visited the districts near Port Moresby. These journeys were, however, apart from exploration, being usually undertaken for the extension of missionary influence amongst the natives. Messrs. Chester and Beswick, also, in 1880 made a short excursion inland under the auspices of the native chief of Momeara.

From this period Australian interest in New Guinea has resolved itself into a more material form, as the brave and daring achievements of successive explorers appear to have supplied our journals with copious material of a romantic and sensational character. Amongst others the names of Messrs. Armitt, Thomas, Morrison, Gleeson, Kerry, must be enumerated. It was during the conduct of one of these expeditions that the enthusiastic and ill-fated Professor Denton paid the last penalty to the malarial conditions of the country while devoting his best energies to science. In 1877 we also notice an expedition, presumably for commercial purposes, under the

direction of Mr. Hartog, a Dutch merchant, who visited the north-western coast of New Guinea, in the neighbourhood of M'Clure Inlet; he portrayed the natural scenery in glowing terms, extolled the natives for the energy and eagerness they displayed in commercial dealings, and narrated the natural and artificial capabilities of the region in a way which should inspire with great hopes future enterprises. We have also to record a visit from Lieutenant Powell about this time to the east and south-east coasts of the island.

We have now arrived at a time which marks, in a practical form, the extent of Australian interest in the Papuan territory. This epoch was heralded by the brilliant and gallant achievements of a Colonial statesman, who, for specific reasons, caused that section of New Guinea east of the Dutch frontier to be annexed to the British Crown. This bold national undertaking was initiated by Sir Thomas M'Ilwraith and promulgated by Mr. Chester, who, acting under the instructions of the Premier of Queensland, took possession on April 4, 1883, in the name of the Queen, of the whole of south-east New Guinea. This action, which was condemned by the home Government, did not, however, continue operative. In consequence of the apparent indifference shown to Australian interests, as affected by these national movements, an International Conference was held in Sydney in November 1883, at which important resolutions were unanimously adopted affirming the expediency of such co-operative action by the Imperial Government as would secure to the British Empire the territory of south-eastern New Guinea, and to Australia an immunity of rights and protection of interests. Doubtless somewhat influenced by the results of this Conference, the Imperial Government authorised the proclamation of a British Protectorate over south-east New Guinea. For the purpose of giving practical effect to the Imperial edict, Commodore Erskine, of the Australian Station, proceeded to its shores, and on the 6th November 1884 proclaimed Her Majesty's Protectorate over south-east Papua. For the better regulation of the affairs of the new Protectorate, Sir Peter Scratchley was appointed

its High Commissioner; and after the demise of that gallant and distinguished officer, who succumbed to malarial fever, our distinguished colonist, the Hon. John Douglas, was appointed, in December 1885, Special Commissioner. During his term of office, which continued till the proclamation of sovereignty over the formerly protected territory, that distinguished Queensland statesman performed valuable services in the development of the country, and in the successful promotion of friendly intercourse with its native inhabitants. It was during Mr. Douglas's régime that the demarcation of British territory was effected and the boundaries between the German and British Possessions satisfactorily established. These national divisions, which mark the limits of what are now known as British and German New Guinea, are specified in Parliamentary documents as follows:—"Starting from the coast near Mitre Rock, on the 8th parallel of south latitude, and following that parallel until intersected by the meridian of 147 degrees east longitude; thence in a straight line, in a north-westerly direction, to the point of intersection of the 6th parallel of south latitude with the 144th meridian of east longitude; thence continuing in a west-north-westerly direction until it meets the point of intersection of the 5th parallel of south latitude with the 141st meridian of east longitude; giving an area on the German side of about 67,000, on the English side of about 63,000 square miles, and nearly approaching the water-parting line or natural boundary." To this are added "the Trobriand, Woodlark, D'Entrecasteaux, and Louisiade groups of islands, and all other islands lying between the 8th and 12th parallels of south latitude, and between the 141st and 155th meridians of east longitude, and not forming part of the colony of Queensland; and furthermore including all islands and reefs lying in the Gulf of Papua to the northward of the 8th parallel of south latitude."

Reverting to the field of exploration, we find Mr. Edelfelt, who, on two exploring expeditions in 1884 and 1887, examined the Maiva district and a small portion of the country in the neighbourhood of Mount Yule. He also made two unsuccessful attempts to ascend

Mount Yule. In 1885, Capt. Strachan, in the schooner *Herald*, sailed from Sydney on a trading and exploring expedition to British New Guinea. He ascended the Mai Kussa River to its junction with the Prince Leopold River. Numerous salt-water estuaries of these rivers were named by him, and the delta formed by the conjunction of the Prince Leopold and Mai Kussa Rivers he named "Strachan Island." In the same year the New South Wales Branch of the Royal Geographical Society of Australasia organised and equipped a costly scientific expedition to explore the interior of British New Guinea. This expedition, which was composed of twelve Europeans and twelve Malays under the leadership of Captain Everill, was despatched from Sydney in the S.S. *Bonito*. Entering the Fly River, they ascended it to the bifurcation observed by D'Albertis on his third ascent in latitude $7^{\circ} 34'$ south, longitude $141^{\circ} 21'$ east. The tributary, which maintained a general northerly direction, was named the Strickland River, and its waters navigated 130 miles from its juncture with the primary. Here the *Bonito* grounded, and the explorers proceeded in a boat farther up the river to a place the geographical position of which was estimated to be about $5^{\circ} 30'$ south latitude, and $142^{\circ} 22'$ east longitude. At this point the expedition turned back, and joining the *Bonito*, which had been floated, proceeded to Sydney, where it arrived in the beginning of December 1885, after an absence of about six months.

During the years of 1885 and 1886, Mr. H. O. Forbes, the well-known naturalist, made excursions in the neighbourhood of the Astrolabe Range, north from Port Moresby, his object being to reach the summit of the Owen Stanley Range; but signal unsuccess, we are sorry to record, was the chief feature in the history of this enterprise. The Royal Geographical Society of Australasia contributed £500 to the expenses of this expedition. In 1888 Mr. Forbes again made an unsuccessful attempt to explore the Owen Stanley Range.

In 1886 the New Guinea Government despatched Mr. G. Hunter,

accompanied by one white man and a black boy, on an expedition to the Kemp-Welch River. Starting from Kapakapa, they travelled in a north-east direction to the Kemp-Welch River, which they traced upwards to Dokoro village. After examining the surrounding country, and naming several physical features, they returned to Port Moresby.

The Victorian Branch of the Royal Geographical Society of Australasia in 1887 equipped and despatched an expedition to explore the high lands of British New Guinea. This expedition, which was under the command of Mr. W. R. Cuthbertson, a practical and experienced land surveyor, travelled through the basin of the Kemp-Welch and successfully ascended Mount Obree; the neighbouring country was surveyed, several prominent features were named, and the expedition, which was the first to accomplish the ascent of one of the leading heights of British New Guinea, was attended with great success. In the same year we also find Mr. Bevan proceeding on an excursion to the head of the Papuan Gulf, where he entered the Aird and Wickham Rivers, and after steaming up their waters to the termination of tidal influence, he returned and navigated their deltaic system. After an absence of a few weeks from civilisation he returned to Thursday Island. At the end of the year, he again started on an excursion to the Gulf of Papua in the steam-launch *Mabel*, accompanied by Mr. Hemmy, a surveyor. On this occasion he steamed over his previous routes, for the purpose of having their geographical positions authenticated by the surveyor.

This year, 1887, appears remarkable for efforts in the exploration of New Guinea. We also observe a visit to the Gulf of Papua from Captain Hennessy in the mission schooner *Ellengowan*, who navigated, in the ship's-boat, several deltaic channels in the neighbourhood of the Vailala River; he also examined and named the Bloomfield Harbour, which forms the mouth of the Panaroa River.

While this exploratory campaign was in vigorous operation in British territory, our German neighbours were not altogether unmind-

ful of the requirements of colonisation in exploring an entirely unknown region. We find Baron von Schleinitz, Governor of German New Guinea, in the *Ottilie*, engaged upon a voyage of exploration in November 1886. During this voyage the coast was examined from Fortification Point to the mouth of the Kaiserin Augusta River, the geographical position of the Purdy Islands determined, and other islands in the Bismarck Archipelago visited. An interesting account of this voyage is published in *Nachrichten über Kaiser Wilhelms-Land*, Heft. ii., 1887.

In the early part of 1886 Captain Dalmann, in the *Samoa*, made an exploration of the lower section of the Kaiserin Augusta River, which was navigated for a distance of about thirty-five miles from its mouth. In the account of his journey Captain Dalmann reported favourably upon the conditions and general aspect of the country; the natives were very numerous, and did not make any hostile demonstrations. This preliminary exploration was followed up in 1887 by the steamer *Ottilie*, which ascended the river 370 miles. This river, which was very tortuous, maintained a general south-westerly trend. The country above tidal waters was beautiful in aspect, with forests of valuable timber interspersed with downs of rich scrub-land; and the natives of the region, who were very numerous, were apparently of a friendly disposition.

While thus referring to past explorations and discoveries in New Guinea of which we possess records, let us also accord our tribute of appreciation to more obscure and unostentatious workers who have taken a practical part in the pioneering struggles which have not been the least important in Papuan development. These men, who are usually designated under the general appellations of "timber-getters," "traders," "diggers," &c., are the true pioneers of New Guinea. They may not be given to the noble work of evangelising, theoretically, but they do aid materially in its initiation by paving the way, not infrequently by the sacrifice of their lives. We are told much of the early struggles of mission life in "heathen"

lands ; of the self-sacrifice, solitude, danger, peril, and privation ; but of the sun-burnt, weather-beaten pioneer, carrying his life in his hands, we hear but little.

We have now entered upon an epoch in Papuan history remarkable for the energy displayed in the field of exploration and the promulgation of national principles throughout the British Possession. Dissatisfied with a form of protection which limited individual and collective enterprise, possessing vaguely defined powers, the contributing Australian colonies were anxious for the establishment of proper government in British New Guinea. This cause was warmly and ably advocated by our learned and eminent Queensland statesman, the Hon. Sir Samuel Griffith, then Premier. This celebrated legislator formulated the British New Guinea Constitution, which was discussed by the Colonial Conference held in London in 1887, in which Sir Samuel took a prominent part. Approving of Sir Samuel's scheme of administration, the Imperial Government authorised the erection of the formerly protected territory of New Guinea into a British Possession. Proceeding to Port Moresby in H.M.S. *Opal*, Sir William MacGregor, M.D., K.C.M.G., who had been appointed Administrator, proclaimed British sovereignty over the formerly protected territory on September 4, 1888, in the presence of Captain Bosanquet, the officers and men of the *Opal*, the Government officers, European residents, and assembled natives.

British New Guinea is governed by an Administrator, appointed by the Crown, who has to consult with and report to the Governor of Queensland in all State legislative matters of importance, and in administrative affairs relating to the public interests. The Administrator is supported by two State Councils, the Executive and the Legislative. The former is composed of the Administrator, as President, together with the chief judicial officer, the Government Secretary, and a Resident Magistrate, as members thereof ; the latter is made up of the members of the Executive Council, together with such officers of the Government and others as the Administrator of

the Government may from time to time be pleased to appoint. In so far as applicable to the circumstances of the Possession, and not repugnant to any provision in its Constitution, the laws of Queensland have been adopted as the laws of British New Guinea, with certain amendments and modifications. Courts of Petty Sessions are established and presided over by a Resident Magistrate, having the same jurisdiction as a Police Magistrate in Queensland. A Court of Record, called "The Central Court," has been created, possessing jurisdiction over criminal offences and in civil cases, having authority similar to that of the Supreme Court of Queensland. An appeal may be made in civil matters to the Supreme Court of Queensland if the value or amount in dispute exceeds £100; and in criminal cases, where sentence exceeds three months' imprisonment. The courts established have been found to work well, and a promising commencement in the administration of justice has been effected.

Affairs in New Guinea now begin to assume a new aspect. Courts have been established, before which European and native alike may find an equal measure; and the rapacious acts of the benighted heathen are destined to give place to law and good order under the munificent and wise guidance of a beloved Administrator.

CHAPTER II.

EXPLORATIONS IN THE LOUISIADE ARCHIPELAGO.

“ But the commanding Muse my chariot guides,
Which o’er the dubious cliff securely rides :
And pleased I am no beaten road to take,
But first the way to new discov’ries make.”

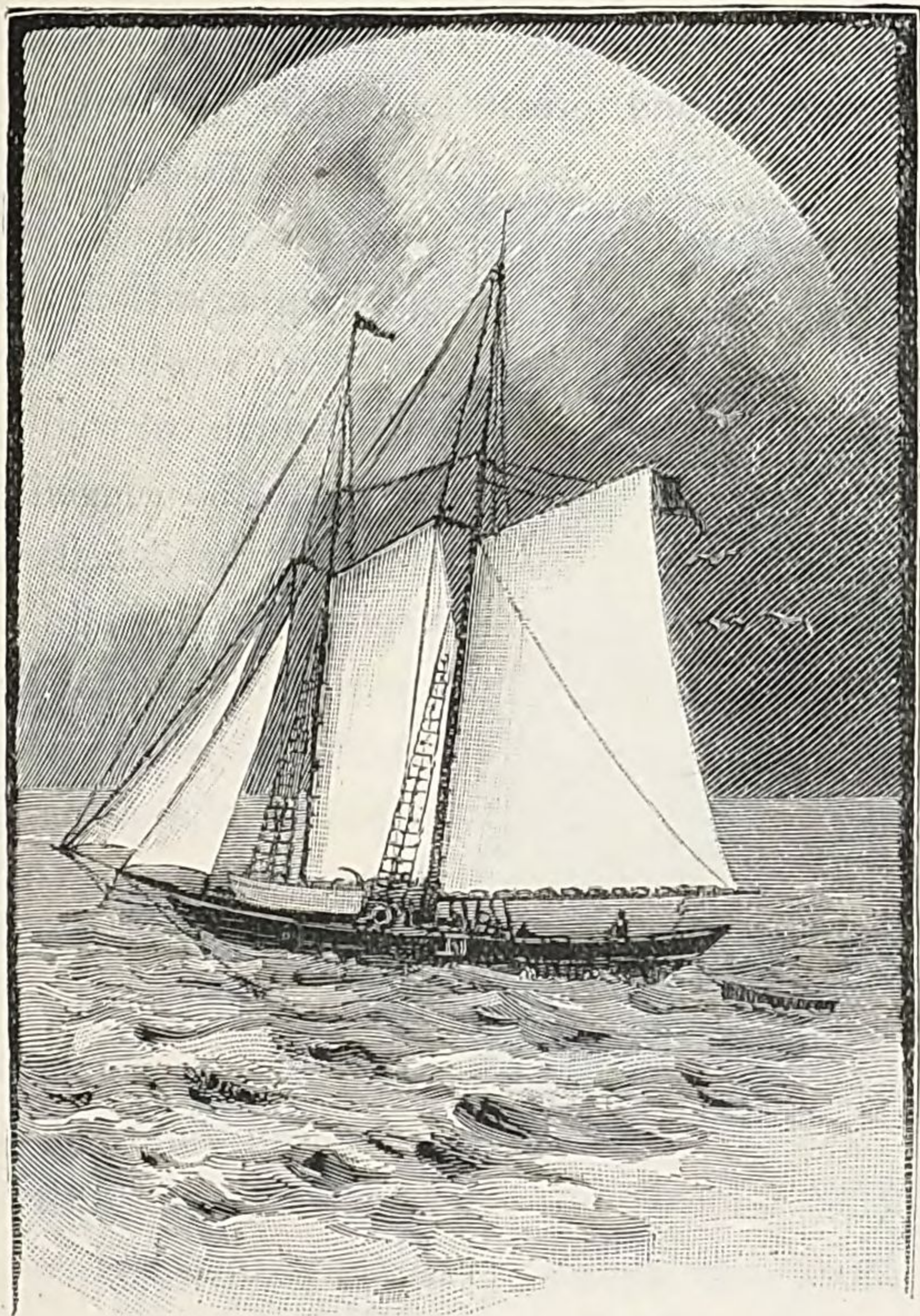
—DRYDEN’S *Virgil*.

AFTER proclaiming sovereignty over British New Guinea, Sir William MacGregor proceeded to the islands of the Louisiade Archipelago by way of Kerepunu and other places in the south-eastern section of the Possession, which will form the subject of another chapter.

After a somewhat tedious voyage of ten days in the schooner *Hygeia*, Sir William landed on the shores of the island of Sudest, his object being to inspect the island, which had become an active gold-field, and inaugurate some form of administration for the better management of the mining population, who by that time had increased very considerably.

Sudest is a long and somewhat narrow island, extending longitudinally in a N.W. and S.E. direction for about fifty miles, and about fifteen miles at its greatest breadth. It is the largest island in the Louisiade Archipelago, formed of a succession of irregular hills and mountains, which culminate in Mount Rattlesnake, over 3000 feet above the sea. These mountains are covered with dense forest and vegetation, and the lower regions with beautiful grass. Sir William crossed the island and examined its geological formation, which he found to be slate and crystalline quartz. Gold has been found in nearly all the watercourses, but more particularly in the bed of the

Runcie River, where good alluvial deposits have been discovered in moderate quantities. The gold-diggers in Sudest are an orderly and law-abiding class of men, and the native inhabitants have indicated no hostile spirit towards their European neighbours. The periodic raids of the wild cannibal head-hunters of Brooker Island fame have



THE HYGIEA.

wrought sad havoc amongst this ill-fated island tribe, who for years have led a life of terror.

Rossel was next visited and inspected by Sir William. This island, which is situated about sixteen miles to the east of Sudest, possesses a most irregular and tortuous coast-line, fringed by a barrier coral

reef, terminating in the east in Rossel Spit, rendered famous by its oft-told tale of shipwreck and danger. This end of the island itself is known by the appropriate name of Cape Deliverance. Clothed with dense tropical vegetation and sombre forest, so dense as almost to defy penetration, abounding in beautiful orchids, and inhabited by the lovely birds of paradise, the island inspires the beholder with wonder and amazement. The interior of Rossel is composed of irregular, rugged, and precipitous hills and ridges, culminating

in Mount Rossel. After examining the shores in the neighbourhood of disembarkation, Sir William set forth to explore the interior, a task which proved very arduous owing to the rugged nature of the country, the density of forest and vegetation, the slippery nature of the surface, and the drenching rain, which impeded progression and rendered the transport of equipments tedious. On the second day out he camped at a native village at the back of the main range, across which a native track had been followed. This village, which was naturally fortified, re-



NATIVE WOMAN, BROOKER ISLAND.

joiced in about ten houses, possessing thatched roofs and trap-door entrances in the floor, built on a platform five feet from the ground. The household effects apparently consisted of sago baskets, earthen pots, adzes made of ships' bolts and chain plates, spears without barbs, human skulls, other human bones, and the bones of the turtle and dugong. Cooking was performed under the houses in pots placed upon triangles of stones. This village, which was approached by a wide, well-kept road, was cleanly

swept and presented a healthy appearance. The geological formation of the island is slate and crystalline quartz, possessing characteristics almost similar to that of Sudest; the soil is very rich, and the hills and valleys luxuriantly fertile. Some of the creeks were prospected by the twelve miners attached to the expedition, who obtained indications of gold. Cannibalism and head-hunting appear to be the distinctive features in the social life of the Rossel natives. These characteristics were fully apparent by the profusion of machines of war and bloodshed in their possession, and the numerous deposits of human bones throughout the island. The people are short and squat, with dark-brown skins; they enlarge the lobe of the ear and bore the cartilage of the nose, but do not appear to tattoo. The women wear the grass petticoat, and the men the leaf of the pandanus fastened to the waist by a cord of human hair; and the dialect they use is apparently different from that of other neighbouring tribes. Their ornaments consist of the nose-shell and other savage adornments peculiar to these heathen races.

Sir William next proceeded to Joannet. This oblong island, situated about twenty-six miles north of Sudest, contains an area of about twenty-five square miles, composed chiefly of numerous hills and ridges, which culminate in rugged peaks of from 800 to 1000 feet above sea-level, and constituted of slate, with veins of quartz in great abundance. The island is clothed with forest and luxuriant vegetation, well watered by numerous creeks and rivulets. Forest has at an early period apparently covered the whole island, but somewhat extensive clearings have from time to time been effected, presumably for plantation purposes, so that the timber resources of the island at this time do not cover probably more than one-half the original area. The middle of the island contains a marsh of about a mile and a half in diameter, apparently well adapted for a rice-field. The banks of creeks and the gullies are studded with clumps of the sago palms and pandanus patches, which, being supplemented by cocoa-nuts, probably constitute the natural

resources of the island, upon which its few native inhabitants apparently depend for food. These wretched natives, who are given to a nomadic life, apparently frequent the only habitable village on the island. This miserable place of habitation, consisting of three neglected houses, is situated in the middle of the swamp previously mentioned, and is approached through long rank grass and ferns, cunningly studded with long sharp-pointed spears planted in the ground with their points projecting from the village at the angle most dangerous to the uninitiated in approaching it. In type the Joannet islanders are inferior to their neighbours, as indicated by their irregular features and starved physique.

The island of St. Aignan, which was next visited, is about twenty-five miles long and varying from about one to nine miles in breadth, containing an area of about 150 square miles. Practically the whole island is forest-clad, excepting on the gentle undulating slopes of the eastern end, where old sites mark the once flourishing gardens of the lords of the soil. From the high peaks of Mount Lakia, 3500 feet above sea-level, in the west, to the 2000-foot heights of the east, the general features of the whole island surface are of an extremely rugged and broken character. Deep gorges and fissures separate precipitous mountain faces from rugged hills and spurs whose bases project in bold buttresses into the sea, exhibiting at many points huge slaty slabs. These contortions are chiefly composed of limestone and great masses of conglomerate, with a mixture of schistose slate and quartz, similar to the formation of the previously described islands. A fringe of raised coral exists round the east coast of the island, presenting a perpendicular face to the sea, through which the erosive action of mountain streams acting for ages has cut fissures of 100 feet deep in many places. On the west end the coral fringe appears altogether absent. Some beautiful limestone caves were visited amongst the hills of upheaval. These natural vaults appear to form the channel of a subterranean river, through which the dark torrents of water foam and roar amongst the stalagmitic

forms with which the caverns abound. Some of these immense vaults are obstructed by huge boulders and attain a height of nearly 150 feet. Essentially of a wild, romantic character, the natural scenery of St. Aignan can scarcely be rivalled in any part of the Louisiades. All these islands are apparently metalliferous, as indicated by their geological character and the deposits of gold obtained by the prospecting miners in their watercourses. Some of these specimens appeared water-worn, and others of recent dissociation from the matrix. Considering its rugged and precipitous character, the island is a thickly inhabited one, with a population of about 3000 souls, located in thirty villages, the largest of which contains about eighty houses. Many of these villages were apparently in a state of social warfare, and so unfriendly with each other that fear of being killed prevented an interchange of neighbourly courtesy. That these savage islanders are expert head-hunters was quite apparent from the profusion of human skulls used for decorative purposes in the villages. In the usual heathen taste, they elaborate the front verandahs of their houses with the skulls and right arms of the unfortunate victims who from time to time fall within their carnivorous operations. Some of the houses rejoice in an ornamentation of three or four native skulls, which appear to impart an air of great celebrity to the occupants, and may be periodically increased by fresh accessions to the grim and ghastly altar. As at Port Moresby, their dead relatives are buried under the houses. In the gardens yams and taro are planted, besides which they possess pumpkins, sugar-cane, sago, two edible varieties of the pandanus, bread-fruit, and forest fruit; also fowls and pigs, which appeared well fed. Although very productive, the soil generally is probably too rough to permit of commercial cultivation for export. Some good timber might probably be exported, but the island at present offers no tempting prospect for a large trade in anything. The absence of a sea-reef deprives the inhabitants of the luxury of a fishery of any kind, so that they are dependent altogether upon

the produce of the soil and the fruits of plunder. The men appear to perform the greater share of the work of planting and carrying. They obtain their wives by purchase and practise polygamy. Immoderately vivacious and inclined to suspicion, they seem to be untrustworthy when opportunities offer to plunder with impunity; they are slaves to witchcraft and unbelievers in a future state. Excepting as a medium for the purchase of wives, they have apparently discontinued the use of the stone axe. Clothed solely with the pandanus-leaf, they are on the whole a healthy race. Nevertheless, about three-fourths suffer from severe ringworm, but no indications of leprosy were observed, and phthisis appeared rare. The language, which abounds in words terminating in consonants, does not resemble neighbouring island dialects. The houses, which are similar to those of Rossel and Sudest, excepting that they are constructed with end entrances instead of the trap-door in the floor, appear comfortable, and the villages are cleanly swept.

CHAPTER III.

EXPLORATIONS IN THE D'ENTRECASTEAUX GROUP.

“Exploring every place with curious eyes.”—*Virgil.*

ON October 24, 1887, Sir William MacGregor reached the east end of Normanby, an island comprising an area of about 400 square miles, irregularly shaped, and composed of a high, rugged mountain range, with deep fissures excavated by water agency. This general conformation, which assumes an abrupt and precipitous character at the north-west end, rising in more regular and gentle gradients in the south-east part, culminates in bold, rugged serrations of from 3000 to 3500 feet above sea-level. These are at places encroached upon by deep, broad valleys, which almost divide the range into separate sections. Longitudinally, Normanby extends for about forty-five miles from N.W. to S.E., and about twelve to fifteen miles at its greatest breadth. Possessing no barrier-reef and but few traces of shore-reef, it is surrounded by deep water, which dashes in long heavy billows against its shore, affording the natives no facilities for fishing pursuits, and few safe anchorages to the weary mariner who may seek shelter on its unprotected shores. An examination of its coast showed the so-called Harris Island to be that part of the mainland of Normanby Island consisting of a long low alluvial flat, which had apparently been overlooked by previous observers, and consequently incorrectly delineated on the Admiralty charts. Excepting a large mountain near its centre, which is denuded of timber, the whole island is densely clothed with timber forests and luxuriant vegetation. For planting purposes the natives clear patches in the forest, where cultivation is carried out on a very extensive scale.

The soil, which is very fertile, is a dark-brown mould, resting on beds of clay. Geologically, the south-eastern end of the island is composed of slate, which in degree of hardness varies much in different localities. The surface stratum of this slate is of a plastic character, lying below the covering soil in the form of a variety of pulverised clay. Of a dark colour, firm in texture, as hard as basalt, it is usually found in the beds of watercourses and gullies, lying in layers a few degrees from the horizontal. Between these thin layers of slate many nodules and veins of quartz are deposited, the latter hard and crystalline, white in colour, and not associated with metal. In the beds of these watercourses indications of alluvial gold were obtained, but no auriferous deposits could be detected in the rocks. Upon examination Sir William found the middle section of this island of a similar formation to the eastern end, with the slate somewhat harder, the quartz less abundant, and an additional dolomitic kind of rock. Traces of gold were also obtained here. North from the so-called Harris Island the formation consists of limestone and traces of coral texture, with which is associated great clamshells imbedded in the rocks of the hills. Large beds of basalt and boulders of silicious rocks are also deposited in the river channels. The formation of the mountains of the north end appears to differ in character from the other sections of the island; here the rocks are porphyritic, with quartz boulders in the creek-beds, which also contain deposits of tin. It appears probable that minerals may be worked to advantage on the island.

The population of Normanby is dense, probably numbering not less than 6000 people, divided into tribes, who speak different dialects, and who appear in a state of constant warfare, so that much of their time is occupied in planning modes of attack and defence. They all appear remarkably healthy, and itch, leprosy, phthisis, fever, ophthalmia, and elephantiasis are absent. Probably about a fourth of the whole population suffer from the ringworm so common to Polynesia.

The natives are expert agriculturists. They apparently devote

much attention to their plantations, which, owing to the rugged and precipitous nature of the island, are usually located on the steep hill and mountain faces, where the slopes are in many places little short of sixty degrees. These plantations, which are very extensive, have fences round them about five feet high, to afford protection from the intrusions of pigs and kangaroos; while the soil is prevented from dislodgment during the heavy rains common to tropical areas by the trunks of trees placed at short intervals transversely over the steep sections of the plantations. Individual holdings are defined by long branches of trees placed longitudinally, so as to divide the area into sections and sub-sections. These hillside plantations, which are formed into regular terraces, are very picturesque.

In one of the inland villages no fewer than thirteen human skulls were seen over the door of one house alone; these, it was stated, were the trophies of their predacious raids upon their western neighbours. The wooden spear, the ebony club, and the metal-headed axe are used as weapons, supplemented by the bow and arrow in the interior of the island. The people plant yams, taro, sugar-cane, sweet potatoes, and bananas; they also grow ornamental plants about their houses, and decorate the villages with amaranths, crotons, and the hibiscus. Their natural head-ornament consists of grotesque mops of black frizzly hair. There are a few with wavy hair, and these are generally characterised by coarse, irregular features. The men are not tattooed, but frequently make their naturally grim faces more hideous by ornamentations of dark pigment lines. The women are usually tattooed, and wear grass petticoats from the waist to the knee, often of great thickness. The usual band of the pandanus-leaf forms the only covering of the men, and that is fastened round the waist by a girdle of twisted cord made of human hair. Boys and girls affect the same manner of covering as adults. Clay pots obtained from neighbouring islands through the medium of barter serve for cooking purposes. Their domestic animals appear to consist of the pig and dingo.

Fergusson Island, which is very irregular in its conformation, with numerous bays and headlands, is about forty miles long, and about twenty-four miles across its greatest breadth, containing a superficial area of about 500 square miles. The physical features of the island are of a mountainous character, rugged, precipitous, and irregular, with Mount Kilkerran in the east, attaining an altitude of about 6000 feet; the Maybole Range in the north-west, whose peaks culminate at a height of 5000 feet; and an extensive range, varying in altitudes of from 3500 feet to 4000 feet, terminating in Cape Mourilyan in the south-west. Irregular in outline, the south-east section consists of a number of deep bays formed by low hills terminating in the sea. Geologically the two principal mountains, which are similarly constituted, are composed of micaceous schist, with which are associated veins of nodular white quartz. The beds of creeks and watercourses are composed of boulders of quartz and masses of slate rock associated with silica, so that in some the whole consolidated mass bears a resemblance to sandstone, while others possess a grey porphyritic appearance.

The formation of the south-east section of the island is entirely of igneous origin. Although the various localities were prospected, no traces of gold could be found. Owing to the precipitous nature of the mountains, the formation of alluvial deposits would not be probable, and unless more favourable conditions exist in the interior, which was not examined, the island is apparently not metalliferous. As with Normanby, no barrier reef forms a protecting cordon around the island of Fergusson, and for this reason the natives do not possess an important fishery. From the east end of Dawson Straits to Mount Kilkerran the seaboard is composed of volcanic hills, separated by extensive valleys containing few inhabitants on the coast, and clothed with beautiful forest trees, which by their variegated foliage and rich colours enhance the beauty of the landscape. The southern and eastern slopes of Mount Kilkerran, from the seashore to its central section, is fully populated, the upper

regions being densely forested and the lower zones covered by plantations.

Although steep and apparently inconvenient for habitation, the face of the mountain overlooking Hughes Bay is occupied by villages situated from 500 feet to 1500 feet above the sea; this condition of location is rendered the more remarkable by the absence of settlement upon apparently desirable sites on this part of the coast and in Hughes Bay. Generally very fertile, the soil consists chiefly of a brown and rich chocolate-coloured volcanic mould, containing pumice-stone.

Extensive cultivated areas mark the agricultural operations of the natives. These plantations, which are carefully husbanded, are divided into sections by the gathering together of the surface pumice-stones, and these sections are again subdivided into squares having their corners defined by a planted yam and their centres by a stout pole eight feet or ten feet long, which supports the curved ends of four reeds whose bases are placed in the ground near each yam, so that the yam vine may creep along the reed to the central pole. This very clever arrangement produces a graceful and picturesque effect. Their cultivated products consist chiefly of yams, taro, bananas, bread-fruit, and sugar-cane.

The existence of craters, saline lakes, and thermal springs are lasting records of the seismic origin of the island. Native villages are scattered over the slopes of Mount Maybole up to 2000 feet above Hughes Bay. Although carefully looked for, no traces could be found at Cape Labillardiere of the hot springs indicated on the Admiralty chart. Saline lakes and several small hills discharging copious sulphur fumes were discovered in a large area of swampy land in Seymour Bay, now for the first time rendered famous by Sir William MacGregor's discoveries of the existence of these hygienic and otherwise valuable natural conditions. This low land is uninhabited, but numerous villages are scattered over the hills and ridges on the north and south sides of the bay. These sulphurous exhalations

tions were so powerful as to extend to the place of anchorage, about one and a half miles off, where they were observed in the morning to have formed a brown coating on the white paint of the *Hygeia*. At night the vapours accumulate in cloud-like masses in the hollows at the base of the range, whence they gradually spread over the whole bay; in the daytime they disappear under the influence of the sun. Some boiling springs and a lake about a mile and a half from the shores of the south end of the bay were explored. During the dry season this lake covers an area of about ten acres, which is apparently largely increased by heavy rain. Shallow, and tasting strongly of alum, the waters of the lake are brown in colour. Two small creeks of fresh and hot saline water discharge into the lake. Pure crystalline sulphur was observed deposited from dense fumes issuing through small fissures in the side of a hill skirting the lake. This hill is remarkable for its seismic features. At one place small subterranean channels containing boiling liquid exist, at other parts of its surface the order is varied by springs of boiling water issuing from the midst of numerous small vents actively discharging sulphurous vapour, while another section is occupied by a vent about ten feet in diameter containing a seething mass of mud and water, which is sometimes thrown out with great force when violently agitated. The lake is skirted by an area of flat land, about forty acres in extent, whence issue sulphurous fumes in great quantities, but here they are not apparently associated with water, nor were extensive deposits of sulphur observed; this was no doubt owing to the heavy rains, which wash the crystals away before any considerable deposit can accumulate.

About a mile and a half from its shore a saline lake was also discovered between low, wooded hills on the north side of the bay. The waters of this beautiful lake, which in the evening light are of a pale green colour, occupy a surface area of about forty acres, apparently shallow; they tasted strongly of alum and salts. A small, conical hill, about 200 feet high, rather hollow near the

centre, and probably at one time an active vent, occupies a position near this lake ; its irregular surroundings are broken by deep fissures and small tubular openings discharging immense volumes of sulphurous fumes, from which sulphur is deposited upon the surface of the hill in a pure crystalline form ; about the base of the hill numerous small hot springs also exist. Sulphurous fumes are emitted here in much greater quantity than in the neighbourhood of the other lake ; the crystals, however, are so fine as to be easily dislodged from the steep hillsides by the heavy rain.

The whole of the country in the neighbourhood of Seymour Bay is of the most interesting description, and further extended examinations of it and the district south of the bay will probably discover many more thermal springs, saline lakes, geysers, and other interesting natural conditions.

As a health resort Seymour Bay, with its hot springs, sulphurous fumes, and landscape beauties, may probably be much frequented in the future by residents in New Guinea and other parts. The island is fully populated with about 6000 souls ; although suffering much from the loathsome form of ringworm becoming so common among these islanders, they are on the whole a healthy race of people. Their domestic animals are an apparently indigenous pig and the dingo. The orange family is nowhere represented on the island, neither do we observe maize, cassava, nor beans. No confederation or other bond of union seems to exist between the numerous villages, and all the houses in a village appear to be on an equality.

The inhabitants appear to be divided into tribal sections, speaking distinctive dialects. They voyage in large canoes capable of carrying from twelve to twenty people. They are keen traders, and evinced a great desire to obtain articles of European manufacture in exchange for fishing nets, fish-traps, skulls, and other heathen wares. Their weapons consist of spears, clubs, and iron-headed adzes. As may be readily understood in a large island thickly inhabited, the different tribes possess corresponding temperaments. Some are shy, restless,

and distrustful, and had apparently never before had intercourse with whites; these evinced no desire for European articles of commerce, nor did they offer any of their goods or chattels. Other tribes were quiet, trustful, and undemonstrative, but unwilling to encourage a visit to their villages; while others were friendly, communicative, with no indications of fear for the whites, or dread of firearms, and eager to trade. These various tribes live at enmity and in a state of warfare with each other, so that friendly inter-tribal intercourse is not known to them. Head-hunting appears also to exist, in some of the districts at least, as evidenced by the display of human skulls on the verandah posts of their houses.

Some of the villages are composed of a number of comfortable houses, built very closely together, of substantial material, upon six posts of from five to six feet in length, with roofs well covered with the leaves of the pandanus tree, terminating in high, grotesque, peak ends, with a verandah at one end and a latticed framework placed horizontally between the floor of the house and the ground; these villages are usually kept clean and in good order. Other villages are formed by a few badly-built small houses with straight ridge-poles, roughly thatched, and without any side walls excepting the projecting parts of the roof, the whole structure being supported on slender posts; the floors usually consist of a number of laths. On the whole, the inhabitants are pacifically disposed towards strangers, and through frequent intercourse with orderly Europeans they might in time become a peaceful and useful people.

Goodenough Island, with which we are next made acquainted through the indomitable courage of Sir William MacGregor, is separated from the western end of Fergusson Island by Moresby Straits. It comprises a bold mountain range, extending north and south through almost the entire length of the island, and culminating in two rugged peaks of from 6000 to 7000 feet above the sea; this range is flanked by a rather extensive plain of about seven or eight miles broad, denuded of its once beautiful virgin forest mantle, and

now studded with numerous native plantations, for which its rich soil so well adapts it. Part of the mountain slopes has also been cleared of its forest, and is now occupied with terraced gardens planted with yams in small mounds; the bases of these terraces are sustained by stone walls, which not unusually extend round the



STEEPLE HOUSE.

entire perimeter of the garden. This form of cultivation, which was nowhere else observed in British New Guinea, affords an adequate and graceful means for the profitable utilisation of hillsides and mountain faces for food-yielding purposes, which might otherwise have been waste and barren; it also gives the country a variegated

and romantic appearance by the infusion of brightness into the gloom and sombre aspect of the primeval forest and lone surroundings.

The general geological character of Goodenough is slaty schist, associated with large deposits of mica and veins of quartz, with additional fragments of igneous rock in the channels of the water-courses and on the ridges. Some of the coastal headlands of the straits are of volcanic origin. This volcanic character is prominently indicated by the existence of an extinct vent, originally about 150 yards in diameter at the mouth, and probably about the same measurement in depth. The original active agency of this small vent is permanently recorded by the existence of a great mass which has been ejected seventy or eighty yards from the base of the cone; its activity has, however, long been subdued, for we now observe the bottom of the crater decorated with the cocoanut palm and other forms of trees, probably not less than sixty years of age. Limestone caves exist on the mountain spurs, and the numerous small hills which form the chief physical features of this locality are of igneous formation, partaking of the general character of the opposite shores of Seymour Bay. The localities visited were prospected by the miners, who found deposits of gold in the bed of one of the creeks.

This island is thickly populated by various tribes, who inhabit villages constructed upon independent bases, but maintaining friendly relations with each other. Clay pots of native manufacture are used for the cooking of food, which consists of the usual vegetables, with fish and flesh—human and other. The head-hunting propensities which characterise the barbarous cannibal natures of the neighbouring island inhabitants apparently also exist in the social code of the more friendly communities of Goodenough, as shown by the usual skull decorations upon the house posts. The men wear the usual perineal band of pandanus leaf, and the women the thick grass petticoat. They are sufferers from the common form of ringworm, but, notwithstanding, they are an apparently healthy people, enjoying an immunity from leprosy, ophthalmia, itch,

and other evils of the flesh. Although possessing canoes, they are practically a class enjoying the solitude of bush life; undemonstrative, of friendly disposition, and less suspicious than their noisy, excitable neighbours, they are likely to improve upon acquaintance, and may eventually become useful. The dingo and pig are the only domestic animals they possess. They live in houses of an altogether different order of architectural design from that previously met with; this consists of a curved roof, about five feet broad at the base, resting upon a lath floor. One end of the roof is five and a half feet high, enclosed by planks of wood; the other end is about ten feet broad at the base, and about the same in height. These structures, which are long and out of proportion to their other dimensions, give to the villages a peculiar aspect. The villages also possess some large divans about three feet in height, with flat stone slabs for lean-backs. Graves of consequence are covered with ornamental shrubs. In some of the coastal villages the houses are built on coral foundations. Their weapons of war consist of spears, adzes, slings, and clubs.

Situated at the head of Dawson Straits, between Normanby and Fergusson, is the island of Goulvain. This island, which contains an area of about five square miles, is of volcanic origin, with its central position occupied by an extinct crater, whose deeply furrowed and contorted walls attain a height of about 500 feet. It resembles in its general physical characteristics the crater on the island of Fergusson. The south side of the island is constituted of low hills separated by flat land, which gives to the face of the country an undulating aspect; these areas are covered with beautiful shady groves of the cocoanut palm, and densely populated, the whole island containing a population of probably not less than 1000 souls, who are unable to find sufficient cultivable land in their own neighbourhood for their support, a want probably supplied by their neighbours on Fergusson Island, with whom they are apparently affiliated by ties of blood and otherwise.

Referring to Welle, we may describe it as a low-lying island, also

of volcanic origin, containing an area of about twenty-five square miles, whose physical features in no place exceed a height of probably 300 feet above the sea. The population numbers about 250 inhabitants, who scorned all efforts made by the expedition to encourage friendly advances.

It is no doubt owing to the discovery of gold on Sudest, and its further development in the adjacent islands, that we are indebted for our knowledge of the geological character and other conditions of the Louisiade and D'Entrecasteaux groups. The insatiable lust for the yellow metal has from time to time brought 700 or 800 men to the shores of these islands, who have been enabled to live by alluvial mining, and there can be no doubt that the real and prospective development of the islands and of the shores of the mainland of New Guinea will be largely influenced by the discovery of metaliferous areas sufficiently rich in gold to be remunerative. It is through complications arising from the development of gold-fields that our troubles with the native inhabitants may be looked for.

CHAPTER IV.

CHADS AND CLOUDY BAYS—THE RAPACIOUSNESS AND SAVAGERY OF THE NATIVES.

“ Though in the paths of death I tread,
With gloomy horrors overspread,
My steadfast heart shall fear no ill,
For Thou, O Lord, art with me still.”

—ADDISON.

THE position of Chads Bay is on the north of the long peninsula stretching east from the head of Milne Bay to East Cape, and overlooked by a long, irregular, and rugged mountain range, extending in a general east and west direction, with broken peaks whose heights attain from 3000 to 4000 feet. The whole of the range is covered with dense forest, excepting its northern slopes, where scattered areas of clearing are observed extending over the face of the range to a height of probably 3000 feet; the soil upon the southern slopes is rich and productive. Although practically of a rough mountainous character, the country in the neighbourhood of Chads Bay comprises limited areas of flat land, bounded by the mountain range and the seashore, of from two to three miles in extent, and occupied by native villages. These areas of flat land are composed of rich alluvial soil, yielding native food in great abundance, and beautified by extensive groves of the graceful cocoanut palms. The villages are located upon low ridges, and the houses are built upon posts some six feet from the surface of the ground, one end of which supports a verandah; the whole superstructure is covered by a roof, which, in the habitation of commoners, assumes the straight form, with a

varied architectural order, approaching the shape of a saddle, over the dwellings of people of rank. In groups of twos or threes, the houses of large villages are usually separated fifty yards apart by areas of fruit-trees and ornamental shrubs. Basalt and coral from the seashore are used to cover the surface spaces between the houses, so that the villages possess an appearance of cleanliness. Clay pots supported by stone tripods serve as household cooking utensils at times, and especially on extraordinary occasions supplemented by beds of hot stones, upon which food is placed, and covered over by leaves of trees and soil, so that the whole heat of the oven may be conserved and applied to its contents. The dingo, fowl, cross-bred pig, and cat appear to constitute the domestic animals of the native inhabitants of this region.

The natives of Chads Bay and neighbouring districts are typical Papuans, whose tribal distinctions are chiefly defined by the two different dialects spoken by them. The population, which amounts to about 100 per square mile, is banded together into federal communities with no apparent supreme organisation of control, as neither sections nor individuals appear to recognise the sovereign authority of chieftainship. Tattooing, which is uncommon, is only met with in rare cases, where marked lines are apparent on the backs of a few of the men. They are an idolatrous people, whose notoriety will form the subject-matter of a sad chapter in Papuan history, chiefly for their treachery and barbarism connected with the piratical attack on the trading ketch *Star of Peace*, and the murder of the captain.

The details connected with this tragedy illustrate the capabilities of the human race in inordinate and uncontrollable desire to plunder. The ketch *Star of Peace*, of about eighteen tons burden, navigated by Captain Ansell, who was part owner, and manned by two native sailors, anchored in Chads Bay on October 28, 1888, for the purpose of entering into commercial relations with the native inhabitants, who were accustomed to trade with Europeans in copra and other indigenous products. On the following day the natives,

who on the previous day had sold copra to Ansell, boarded the ketch in unusually large numbers while the captain was below in his cabin. Fearing a premeditated attack, the native sailor, Charlie, apprised Ansell of their dangerous position, who, upon receipt of these tidings, directed Charlie to heave the anchor and set sail. While he was promptly executing these orders, assisted by some of the natives, while others were actually actively engaged in plundering ship's stores, the captain made his appearance on deck, and was thereupon seized by the arms by four natives, who forced him down, while a fifth smashed his head with the pump handle. Charlie attempted to defend the captain by drawing his revolver, but the murderers immediately pounced upon and disarmed him, and the other sailor, who was a native of Queensland, was severely wounded in attempting to escape by swimming. After despatching Ansell they commenced to pillage the vessel, and to carry the goods and stores to the shore. The two sailor boys were also taken on shore, and given to understand that next day the fate of their late wretched master would assuredly be theirs. With the dawning of next day their fiendish spirits appear to have been slightly modified through female influence, as the prisoners were not put to torture, nor did they suffer death; but, after a short imprisonment, in hourly dread of decapitation or some more horrible form of death, they successfully effected their escape.

After the receipt of news of this outrage, H.M.S. *Rapid* was despatched to Chads Bay to endeavour, if possible, to capture the murderers. The body of Ansell was disinterred and buried at sea, and efforts were made to trace the perpetrators of the crime; but success on this occasion did not attend these operations. It was observed that the natives had burned the *Star of Peace*—the only remaining parts of the ill-fated vessel being part of the stem and stern-posts.

As soon as the confirmation of the grievous news reached him at Samarai, Sir William MacGregor prepared to hasten to the scene of the tragedy. As an attempt to effect a capture in the daytime in

any of the coastal villages, whose inhabitants were ready at the slightest notice to seek the friendly cover of the forest, would almost certainly be abortive, it was arranged to effect a surprise under cover of darkness. With this object in view, the expedition, composed of Sir William and his small staff of followers, embarked in the schooner *Hygeia*, which cruised towards the coast of Normanby Island during the daytime until darkness set in, when a change of course was made and a silent landing effected at 3 o'clock on the morning of the 19th November 1888 at the village of Auwaiama, in Chads Bay. Notwithstanding the great caution exercised in surrounding this large centre of population, the operation was a failure. Some of the neighbouring villages were also similarly operated on, but with no satisfactory result: from out of fifteen to twenty villages the occupants had decamped to the forest and jungle, leaving behind them everywhere traces of the articles plundered from the *Star of Peace*.

Hoping the natives would return to their houses on seeing the vessel's departure, a small party remained behind in the principal village of Chads Bay, and the *Hygeia* left for Samarai with the miners who had accompanied the expedition as volunteers. Soon after the departure of the schooner some men appeared, accompanied by a woman, who was captured, and afforded the expedition some useful information. The party, who had been further recruited by an additional member, continued in occupation of the whole of Ansell Peninsula, a portion of which was daily searched, so that the natives were thereby afraid to occupy their villages. Although an infringement of current orders, some of the party, it was believed, had managed to cause the destruction of a large village by fire.

After many pacific overtures the Tauputa tribe, located immediately north of the chief scene of action, was induced to aid the expedition against the people of Chads Bay, whom they regarded with feelings of enmity, and on the 25th November two young Papuans who had been directly instrumental in the attack upon the

plundered vessel were captured, and the Martini-Henry rifle they had taken from it was obtained. It was found upon investigation that, excepting the two tribes of Mita and Lillihudi in Milne Bay, the entire population of probably over 10,000 people—from the southern side of Milne Bay to Tauputa, north of Chads Bay—were supporters of the murderers, and had participated in the booty.

With the object of establishing amicable relations with its people, and thereby, if possible, to isolate the Chads Bay cabal on the western side, the party visited Bently Bay in the *Hygeia*, where three different tribes were found in occupation. The Kidara tribe sued for peace; the Huhuna rabble was aggressive and desirous of war, until temporary conciliation was effected by pacific advances on the part of the expedition. Two of them were induced to visit the schooner at anchor in the bay, and from these it was gleaned that one of the leading characters in planning the attack on the *Star of Peace* was actually the chief of this erstwhile hostile tribe, and that one of their number, known as Yakopa, had been apportioned a gun and a case of tobacco as reward for the active part taken by him in the raid upon the ill-fated vessel, circumstances in themselves sufficient to explain the hostile attitude of Huhuna. As soon as these matters became known, the party landed for the purpose of arresting this predacious savage Yakopa. Landing on the beach, the officers of the law were met by about fifty natives in partial war-paint, whose spears were at a handy distance, in large quantities stacked against the trees and bushes. It now became apparent to all that a critical juncture had been met with, when absolute concentration of forces was necessary to success. After scrutinising the surroundings, during which time a general dispersion of the natives had taken place, Yakopa was identified and arrested by one of the members of the party, who, being aided by another, put the culprit in irons. Finding the iron bands would not yield to the strength of his arms when marching to the boat, Yakopa struggled violently and yelled what was evidently the war-cry of his tribe, at which signal

the whole of his supporters dashed impetuously at the party with spear in hand, so that for the moment destruction appeared imminent. A momentary view of the position convinced Sir William MacGregor that prompt and active defence was absolutely necessary for the safety of his party; he therefore ordered his men to fire on the foe. The attack was so persistent that several of the heathen warriors were stretched on the turf to rise no more, and numbers of others were wounded before the aggressors were repelled. The position was a dangerous one, and during the progress of the engagement the artful prisoner escaped, but was shot down ere he could reach cover.

The Polatona tribe, being the most westerly inhabitants in Bently Bay, sought for and obtained the promise of peace, conditionally on its rendering assistance in the quest—a promise which subsequent events proved to be faithfully kept, as valuable assistance was rendered. In the search after them several culprits were arrested, although three of those who had actually taken part in the massacre of Ansell were still in the wilds of the forest of Ansell Peninsula, in the neighbouring mountains, and in the vicinity of Milne Bay. The Tauputa people volunteered in strong force to search the peninsula, but, owing to two of their members being speared after the search had commenced, the remainder had not sufficient courage to continue the task. The same day upon which this occurrence was witnessed, the Polatona tribe brought into camp the remaining arms from the *Star of Peace*. Only one heathen now remained on the north side of the range whom it was desired to arrest, and the inhabitants there were either humiliated or friendly. Numerous and warlike people, however, occupied the village of Abioma, in Milne Bay, and from them aggressive and defiant messages were frequently received; they boasted that shelter was afforded by them to one of the murderers, and stated that they would kill Sir William MacGregor if he attempted to arrest their *protégé*. To Komodo, the chief of Polatona, was entrusted the further search for the outlaw on the northern side of the range, and,

to aid him in the quest, friendly messages were despatched to the people of Chads Bay, informing them that upon the delivering up of the refugee they would be permitted to return to their villages. To secure the friendship of those tribes occupying its northern side, and situated to the eastward of Abioma, the party proceeded to Milne Bay in the *Hygeia*. A few days were occupied in conducting friendly negotiations with some of these tribes, after which promises of active and faithful support were obtained from the people of Mita, when wanted against the Abioma warriors. The tribe westward of Abioma was visited and its co-operation solicited, but it was found that these people were divided in feeling—one half neutral, the other half for the Government.

While co-operative friendship from farther eastern tribes round the head of the bay was sought for and obtained, it was observed that, notwithstanding their almost complete isolation, the aggressive insolence of Abioma in no way diminished. It now became perfectly clear that decisive steps must be taken to subdue the haughty bearing of these warlike people and to effect the capture of the murderer, Hannewanna, to whom they afforded shelter; accordingly, when the necessary preparations had been perfected, all the available force was concentrated, and the entire party, numbering nineteen, all being armed with Winchester, Martini-Henry, and Snider rifles, proceeded in two boats to Abioma. Upon arrival it was found that entire isolation, combined with the unexpected prowess of the expedition, had produced the desired effect, for the natives were intimidated, and permitted themselves to suffer great humiliation at the hands of the party. Having received promise of peace on condition that they would deliver up the man in question, they despatched parties to search for and bring him to camp; but as their movements clearly indicated no active and earnest desire to do so, some of their chiefs were involuntarily removed on board the *Hygeia* as hostages, and conveyed to Samarai, where they were detained until Hannewanna was captured and lodged in jail, where the remaining culprits subsequently

joined him, to await their trial according to the usages of British law, which to them had hitherto been unknown. Cognisant of the important issues of these proceedings, and their ultimate effect upon the people, it was deemed most desirable to conduct the trial at Samarai, so that as many of the prominent natives of the eastern part of the Possession as could conveniently be mustered together should be witnesses thereof. To aid in the attainment of this object Sir William MacGregor restored the Abioma people their chiefs, and on the return trip transported the leading chiefs of Milne Bay by steamer to Samarai.

Efforts had frequently been made to resettle the people of Chads Bay in their houses, but the only successful means of doing so, they said, were a visit from and interview with the Administrator in person, so as to receive his own assurance that the past would be forgotten. Accordingly, Sir William MacGregor left the steamer *Albatross* in Milne Bay and crossed the range to the northern side, where friendly meetings took place with the natives, who expressed deep regret for their wrongdoing. The whole details connected with the attack on the *Star of Peace* and the massacre of Ansell were narrated to them, after which they promised to return to their houses on the invitation of the Administrator, and in the future to conduct themselves so that by the assumption of a peaceful Christian life, through embracing the ethics promulgated by Komodo, amends might, in a certain measure, be made for past misdeeds. As the initiation of these savages into the elementary forms of modern civilisation was not considered a supererogatory function on the part of the first administrator of the territory, Sir William MacGregor proceeded to move to the village of the Tauputa tribe to impart to the people instructions as to future behaviour. The Chads Bay people, who were now anxious that this should be done, stated that "They kill and eat us, and we kill and eat them," and intimated that future conduct could not be in accordance with the principles of civilised life until these practices were abolished.

From Tauputa the party proceeded by steamer to Samarai, by way of Wari. At the sitting of the Central Court at Samarai eleven persons connected with the *Star of Peace* massacre were arraigned. Four of these were found guilty and sentenced to capital punishment, five to imprisonment for twelve months, one to imprisonment for eighteen months, and one was acquitted. The proceedings throughout were closely watched with deep interest by a great number of chiefs and other natives, all of whom appeared to be much impressed by the solemnity of its progress. For wise reasons the extreme penalty of the law was inflicted upon these felons in different places: one was executed at Samarai, one at Abioma, in Milne Bay, and two at Chads Bay, in the presence of large assemblages of natives, who conducted themselves with propriety. From subsequent observations of their actions it was apparent that the impressive character of the proceedings had produced a powerful salutary influence on the native mind, so that the Government had every reason to be satisfied with its action.

The island of Tubutubu, in the Engineer group, was next visited. It was found to be inhabited by about 300 people, who are great traders, having in their possession a number of large ocean-going canoes built at Murva. They appeared to have a grievance against some traders for the alleged abduction of some of their women, but circumstances seemed to indicate that they had been bartered away by their friends and relatives.

Glenton Island was next visited and inspected, with apparent satisfactory results to the inhabitants, who had their social troubles adjusted. Here, as on the former island, the people are active traders, procuring much food from neighbouring islands.

The people occupying the eastern end of British New Guinea had long earned for themselves a notorious reputation for crimes of murder and rapacity, but there are reasons for believing that these outrages in future will not be of such frequent occurrence as in the past.

In September 1889 startling reports reached Port Moresby concerning the horrible murder of two Europeans at Cloudy Bay by the cunning and treachery of the natives; consequently Sir William MacGregor proceeded thither in the *Merrie England* for the purpose of investigating the whole affair, and, if possible, capturing the guilty parties. Landing at the village of Domara, at the mouth of the Domara-Wai River, on the west side of Cloudy Bay, the expedition found the inhabitants had betaken themselves to the bush, leaving their town entirely deserted. The party then proceeded up the Domara-Wai River for about three and a half miles to Merani. When about 100 yards from this village the excited clamour of natives betokened a hasty retreat to the neighbouring jungle, while some were observed to cross the river.

The village of Merani is located on the left bank of the Domara-Wai River, and surrounded by a strong palisade of an oval form some seventy-five yards long and thirty broad, constructed of six-inch saplings some fifteen feet long, deeply fixed into the ground about two inches apart, and kept securely in position by cross bars, to which they are fastened about ten feet from the ground. This fortification is entered by four openings, which in position correspond with the cardinal points of the compass, and these are effectually closed by horizontal sliding bars. The houses, of which there are eighteen, are thatched with the leaves of the sugar-cane over a superstructure, well built on piles, about twelve feet high on a platform three feet from the ground, by which access is obtained to the upper apartment through a trap-door in the floor. The west end of the village is guarded by two tree-houses, with fighting platforms, constructed in large trees about eighty feet high. These houses, which are reached by means of ladders whose bases are inside the palisade while the trees are outside, contain stores of arms of war for the defence of the fortification, which at this point appears the most assailable. The eastern side of the stockade also possesses a tree house overlooking the gate.

These tree houses, which are peculiar to New Guinea, serve to illustrate the social condition of heathen life and the strategic powers of a race who are continually warring, and whose chief aim in life appears to be hostility to neighbours.

The village of Isimari, situated 150 yards north of Merani, was next examined, and found to contain about ten houses similarly constructed to those of the latter village, and fortified by a stockade with only one tree sentry-house inside the enclosure. The inhabitants of this village had also decamped to the friendly cover of the primeval forest, so that Sir William MacGregor found himself in full possession of both villages. An inspection of the Isimari houses brought to light a cloth bag, cartridges, and several other articles of European manufacture, which probably belonged to the murdered men, all of which, together with the food found in the town, were removed to the village of Merani, where the expedition camped during the night. Whilst effecting slight repairs in the weak parts of the fortification of the camp, the party observed many armed natives stealthily watching the operations, and some were heard shouting in the jungle, while others, assuming an aggressive attitude, approached to within sixty yards of the palisade, on the opposite bank of the river. The latter, who were spoken to by the Aroma interpreter, declared themselves the murderers of the white men, and ordered the expedition from the village. On the second day in camp, which was the 3rd October, Sir William MacGregor, leaving part of the expedition in charge of the Merani camp, proceeded down the river for the purpose of obtaining assistance from the chief and people of Domara in investigating into the recent massacre. Accompanied by Ino, the chief's son, and other men of Domara, who had offered assistance, Sir William returned to Merani, where he learnt that the camp was surrounded by hostile natives, who had been throwing spears at the palisade and stoning the members of the expedition. From this active hostile demonstration it became apparent that unless precautionary measures were adopted an attack upon the camp during the night would be

almost sure to follow. After promptly securing the boats a reconnaissance of the surrounding locality was undertaken.

The party, consisting of Sir William MacGregor, eleven Europeans, and two Polynesians, proceeded in a northerly and north-westerly direction for one and a quarter miles, to a place near the margin of extensive plantations, where an outpost of native warriors was suddenly and unexpectedly surprised. Leaving their spears and other weapons behind, they retreated in great confusion to the main camp, about 150 yards distant in the margin of the woods, where great tumultuousness occurred. Frightened women were running hither and thither in their frantic efforts to escape, while the dusky warriors in great excitement grasped the long shafts of their spears, and bade defiance to their white-skinned brethren. For the purpose of permitting the escape of the women the expedition halted for the space of a few minutes, as an active engagement with this savage tribe was now inevitable. Observing this manœuvre on the part of the expedition, the warriors of the tribe became emboldened by what they evidently considered the timidity of the whites, so they commenced the attack with great vigour, accompanied by loud demoniacal yelling, gesticulations, and other demonstrations of savagery peculiar to cannibal operations. On they came with great gusto, keeping well under the friendly cover of the bananas, sugar-cane, felled trees, and tree stumps, until almost within spear-throw, when the expedition opened fire upon them. This had the desired effect, for their noises ceased, and they scattered and fled in great confusion to the forest. They left one cannibal dead upon the field of battle, whose name was Onaki, and who had taken part in the murder of the two Europeans, and several others wounded, but, owing to the cover they made use of, the natives were not severely punished. After this engagement no further hostilities were offered the expedition.

The next day was spent in exploring the surrounding country, but no natives were observed on the north bank of the river. The river was then crossed and an extensive plantation traversed, in the

house of which were found several articles, including three pocket compasses and ammunition, once the property of the murdered Europeans. At the remote end of the plantation, bordering on the forest, a small party of natives was surprised, who left their weapons of war behind them, and rushed with great haste to the cover of the forest. Attempts were then made to establish friendly intercourse with them, but these efforts were evidently misunderstood, as no responsive advances were made further than an interchange of conversation.

The expedition was occupied the following day in exploring the Domara-Wai above Merani in the whale-boat and dingy. This river, which was partially flooded and full of dangerous obstacles, receives a tributary on its left bank about two miles above the village of Merani. A short distance from this point of bifurcation the waters of the left-hand stream pass over a small fall, above which they rush along in a strong and rapid current. This section of the stream, which was being forded by the two unfortunate Europeans when they were treacherously and cruelly murdered, was named Rochefort Fall, while the main branch of the watercourse was named the M'Tier River, both after the victims whose life's blood had mingled with their turbulent waters. A number of small pieces of human skull recently battered into fragments, together with quantities of brown hair, were found on a sandspit below Rochefort Fall, while close by on the bank of the watercourse lay part of a coat made from an old sack, to which was fastened one of the armour copper plates used by one of the murdered men as a shield of defence.

The circumstances surrounding this surreptitious massacre by a wild bloodthirsty tribe of barbarians, together with the details, were fully explained by their own confessions, the information of others in no way connected therewith, and by circumstantial evidence. The victims of this ghastly scene were Rochefort, a Frenchman, and one James M'Tier, a British subject, who had landed on the shores of Cloudy Bay to prospect for gold. Arriving at the village of Domara, they purchased some articles of European trade from a Mr. Anderson,

native trader, who pointed out the dangers of inland travel, and urged them to confine their operations along the coast to the village of Aroma. This timely warning was, however, unheeded by the prospectors, who expressed their determination to proceed into the interior. Their worldly effects consisted of the usual prospecting equipment, some gold, probably obtained from the islands of St. Aignan and Sudest, where they had been prospecting, two revolvers, a Winchester rifle, and a double-barrelled shotgun. As armour they wore sheets of ship's copper round their bodies.

From Domara they were conveyed in a canoe up the Domara-Wai River by Ino, the chief's son, to the village of Merani, with whose people they were placed in charge. Accompanied by Merani people as guides, they started for the interior by a path leading across Rochefort Fall; in fording this rapid stream they were supported by the natives, who held their hands when in the middle of the current, while others, stealthily following behind, struck them on the neck with their tomahawks before they were able to defend themselves. Their lifeless bodies were then plundered, decapitated, and mutilated by the cannibal fiends, who, emboldened by the success of their treacherous exploits, and infuriated by the ghastly wounds of their victims, became clamorous over the spoil. Fearing the displeasure of their neighbours would be visited upon them as just punishment, the manslayers sent a peace-offering of some gold and a revolver to Ino; but the Domara tribe were indignant, and they proceeded up the river to shower revenge upon the village of Merani. This demonstration of retaliation, although indicating a sense of justice in a heathen race, and sympathy with the punishment of crime, was not productive of successful results.

After the examination of the neighbourhood had been made, and there being no prospect of a speedy capture of the murderers, the fortifications of Merani and Isimari were destroyed, and the expedition prepared to depart from this neighbourhood of evil associations and hostility.

The natives are a fierce, bold, powerful people, whose chief characteristics are displayed in acts of rapine and cannibalism, and whose demoralising influences are disseminated throughout the whole district, where the hills and valleys reverberate their war-songs and fiendish yells over the bloody corpses of their victims, and where nature aids their nefarious operations against the unwary by the dense covering of her luxuriant vegetation. Although for a time they eluded the law, those who had taken part in the Rochefort Fall massacre were eventually captured and lodged in jail at Port Moresby, from which place they managed to escape, but were recaptured and subsequently died in confinement.

The district around Merani is chiefly remarkable for the extent of its flat land and the richness of its soil, which is unequalled in any other known part of the British territory in New Guinea: the soil is a brown alluvium of great depth, and the face of the country is clothed with forest and dense vegetation. The natives cultivate extensively, the plantations owned by the Merani people alone being from 300 to 400 acres in extent.

CHAPTER V.

EXPLORATIONS SOUTH-EAST OF PORT MORESBY.

“Through tangled forests, and through dangerous ways,
Where beasts with man divided empire claim,
And the brown Indian marks with murd’rous aim.”

—GOLDSMITH.

THE country to be described extends along the coast from Port Moresby to about the 148th meridian near Keppel Point, being chiefly comprised in the Kemp-Welch basin, and between the Astrolabe and Macgillivray ranges and the seashore. It is a comparatively well-known section of the Possession, and for some years past has enjoyed the distinction of being the maiden field for amateur effort in the paths of exploration and discovery. Several expeditions have passed through the basin of the Kemp-Welch to the highlands of the Obree regions, and the resulting descriptions, if not altogether instructive, have often been amusing. The general physical characteristics of this tract of country are of the ordinary class. The face of the conglomerate, forest-mantled Astrolabe range, skirted by a succession of low hills covered by forests of eucalyptus and grass, and separated by extensive alluvial flats of rich soil. The more eastern section has limestone hills covered with fine pastoral grass, diversified by small belts of evergreen forests chiefly upon the margins of watercourses, with intervening valleys of considerable extent, luxuriant in vegetation and rich in soil. Although occupied along the seashore, the large inland districts are very thinly populated. For this reason, and from its natural conditions, the

greater part of the country seems well adapted for pastoral and, to a less extent, agricultural purposes; horses and cattle would be almost sure to thrive well upon the nutritious hillside grasses, and sheep would doubtless also find congenial pastures. It may therefore not be altogether unreasonable to assume that in the future British settlement of New Guinea the districts south-east of Port Moresby may be active fields of industry, where the boundaries between European and native holdings will be clearly defined and justly respected, and where fields, once the scene of battles and feudal strife, may be beautified by sites of local industry and manufacture, and enlivened by the joyous shouts of merry children and the harmonious peals of village bells.

Some of the village sites are beautified by groves of the coconut palm, but rarely of sufficient extent to be used for commercial purposes. The native food consists of the yam, taro, banana, and sugar-cane, with other auxiliaries. When cultivated food becomes scarce by reason of prolonged droughts and other natural causes, resort is had to the indigenous bread-fruit, the fruit of the pandanus, called *morasse*, two varieties of wild figs named respectively *sabo* and *igulara*, together with the cycad seeds, *hatoro*, and the fruit of a forest tree, *hodava*.

Numerous villages are scattered over this part of New Guinea, especially in the Kemp-Welch basin, from Kapakapa to Keppel Point on the coast: some of these villages are very large, and inhabited by a dense population of natives, who, notwithstanding their frequent intercourse with Christian missionaries, are hostile and barbarous. They do not ride over the face of the country in war-chariots, as did our forefathers in the early days of Britain, but they wield a spear which, although somewhat of a more primitive order, shows no inferior ingenuity in construction, and is certainly much less cumbersome than the early weapon of our fatherland. It is somewhat remarkable that over a comparatively small territorial area the inhabitants are divided into numerous factious communities

whose social institutions are antagonistic to one another; with no mutual effort to a common end, they are practically independent, distrustful, and treacherous to one another. In nature and constitution, differing probably in nowise from the other primitive human races, they live and move in tribal order, sometimes stationary and at other times nomadic. Probably differing but little in organisation from the clans of North Britain in ancient times, they are continually involved in tumultuous warfare arising through the most trivial causes; even an imaginary insult to the meanest plebeian will give rise to disastrous consequences, while erring aim or blow in the chase may cause forfeiture of life and feudal strife. As an illustration of this an instance which occurred in the south-east section of the Possession about the time of Sir William MacGregor's visit may be given. During the progress of a hunt one of the hunters accidentally allowed a wallaby to escape; apparently enraged at this, one of the party was observed to retire from the field, and, as subsequently transpired, plant himself on the side of a path near the village, where he awaited the approach of the unfortunate hunter, whom he killed with a spear.

The villagers of Kaile live in constant dread of the mountaineers of the village of Garia, so that they are frequently afraid to obtain food from their own gardens, lest their enemies fall upon them from ambuscades and ruthlessly massacre them. The districts of Hula and Babaka are at enmity, owing to the latter being accused by the former of robbery; while an accident in the hunting field, through which a Babaka man was accidentally killed by the hunters of Kamale, produced bitter feelings of hostility between the two tribes, resulting in the murder of two of its men and the wounding of the chief of the latter tribe. Nor does this seem strange when we learn that the Quaipo people incurred the displeasure of their Kerepunu neighbours through the theft of a paltry wallaby, and that an imaginary insult upon a Kalo brave is regarded as sufficient cause for hostilities to the village of Quaipo.

The weak and defenceless are considered fair and legitimate game for the bloodthirsty raids of neighbouring tribes, as instanced in the case of the villages of Veiburi and Seme. When this part of New Guinea became specially subject to European influence in 1885, the village of Veiburi was situated on a ridge about a mile east of its present site, and the tribe was then suffering great persecution from the neighbouring clans of Manukoro and Garia. Owing to the incessant raids of these tribes the Veiburi people were compelled to shelter their weak forces in a more secure stronghold than that previously occupied by their stronger numbers. For this purpose their present centre of organisation was established on the bank of a small stream in the midst of very high and large trees; here the village is constituted of two houses on the surface of the ground, and eleven tree houses. These aerial dwellings are constructed in the highest trees, about 100 feet above the ground, and approached by means of almost perpendicular ladders, constructed of long spliced saplings lashed eighteen inches apart by cross bars at every fifteen inches. These houses, supplemented by detached platforms, are stocked with food and weapons of defence, and constantly occupied by their owners, who are so intimidated by the raids of their slayers that they leave their dwellings no longer than they can possibly help for the purpose of procuring their necessary food. Their numbers are now, by reason of frequent massacres, reduced to a mere handful, and they will doubtless soon become extinct unless steps are taken for their protection and amelioration.

The adjoining village of Seme is still more unfortunate and more intensely wretched. Living constantly in a state of fear and anxiety, they inhabit a small village situated on the narrow crest of a ridge between two pyramidal natural formations from fifty to sixty feet high, which affords an excellent defence; this position is still further strengthened by the occurrence of a tree of enormous proportions, which shelters four large houses; this main portion of the village is supplemented by an additional tree-house and two other structures

on the ground. The men probably do not number more than six, including the feeble old chief, and the women and children are of dire necessity almost constantly confined to the tree-houses, owing to the treacherous ravages of the Manukoro savages, who, emboldened



TREE DWELLING.

by their weak and dependent condition, consider murderous onslaught on inoffensive women and children will add largely to their prestige.

On one occasion a Seme woman with three little girls and a boy were wandering in search of food on the bank of a mountain stream, when they were assailed and ruthlessly slaughtered on the gravelly edge of the stream, where their ghastly corpses were left to the

ravages of the birds and beasts of the forest and to the action of a torrid sun, until subsequently found by the men of their own village, who had them conveyed thither. For sepulture a spot had been selected on a low grassy ridge, thinly timbered with eucalyptus, about 300 yards from the creek where they fell. There a platform of sapling stems had been constructed about eighteen feet from the ground, between three trees about twelve to fifteen feet apart in the form of an equilateral triangle; upon the surface of this primitive structure the bodies of the wretched victims were regularly arranged, with their heads resting upon the higher side of the platform—the woman occupying the centre position, with two children of about twelve years of age on each side of her. The shrunken limbs of the children were besmeared with a brick-red substance, but nothing else had been used to cover this ghastly tabernacle.

This custom of disposing of the dead is by no means uncommon in New Guinea; other places there are where a practice of an even more repugnant character exists, the corpses long suspended to the branches of trees within the precincts of the village, and the drops falling from the decaying bodies being collected in vessels, and subsequently used as a stimulant. At other places there are houses specially constructed for the dead, where raised platforms are covered by a roof, leaving the sides open for the circulation of the atmosphere; upon these superstructures the remains of the dead are laid without any other covering until *post-mortem* agency has left nothing but the bare skeleton. To say that these somewhat varied, though in themselves equally loathsome, forms of disposing of the dead are demoralising in their effects upon and inimical to the general condition of the people is superfluous.

Although necessary measures are being introduced for the amelioration of the condition of these people and for their emancipation, the process of transition must of necessity be slow and tedious. Wild beasts of prey are not easily tamed, and primitive

natures require patient and careful cultivation; even the eradication of the noxious weeds and the preparation of the soil for a crop require long application of effort. In our natural state we are prone to superstition, we are susceptible to impressions; even in our civilised state our desires are inordinate, we are easily incited to acts of violence, and are only restrained from the perpetration of crimes equally horrible to those of savages through fear of the tribunal of justice; we are treacherous, designing, cunning, jealous, vindictive; our social and religious institutions divide us into tribes and sects, more dangerous to the commonwealth, by reason of the influence of civilisation, than the unsophisticated barbarian tribes of the dark regions of the earth; even individually we are rendered more dangerous as destructive agents through our enlightenment than the cannibal Papuan: why, then, are we impatient with our primitive brethren in New Guinea? We are suddenly brought into intercourse with a race of people outside the pale of civilisation, people who for generations have lived a wild, unrestrained life, avenging their wrongs by the spilling of blood and the destruction of human life; where murderous acts accomplished by treachery are rewarded as deeds of valour, and distinctions are gained by predatory feats. Yet, notwithstanding these innate characteristics and their surrounding circumstances, we are expected to take possession of and inhabit a wild and imperfectly known country populated by these primitive children of nature, to rob them of their heritage, and effect their rapid transition to the usages of civilisation.

Although the basin of the Kemp-Welch and the country westerly to Port Moresby have for some years been frequented by Europeans, it may be doubted whether the intercourse has produced a beneficial effect upon the social and moral conditions of the native inhabitants—nay, we possess evidence that in this and other parts of New Guinea, through contact with unscrupulous Europeans, they have acquired vices previously unknown and positively inimical to life. Nor is this condition apparently materially improved by mission influence,

notwithstanding the agencies of the London Missionary Society established at Kerepunu, Kaile, Hula, Kalo, and Tupuselei. Their effect will doubtless be felt upon the rising generation; but to expect the present race, born under the influence of demoralising native priesthood, to show good results derived from the application of Christian doctrine is not altogether compatible with human nature, nor in accord with experiences gained through intercourse with other primitive races.

Unfortunately, the degenerative influence of European intercourse is not confined to British New Guinea; its power is felt over a far wider area. It has wrought dreadful havoc among the American Indians and the Australasian races. It has made itself felt amongst the African negroes and the Indian tribes, and its slow poison has infused itself in the vital fluid of the children of Polynesia. It may therefore be aptly said we are destroying one race to provide accommodation for another; and in so doing our measures of extermination are neither just nor noble, nor are they compatible with our so-called Christian principles, nor are the privileges we accord in any measure commensurate with the advantages received. This points to an important question but imperfectly understood—the alienation of native lands. That the whole of New Guinea, whether under British, German, or Dutch control, is the lawful property of its native inhabitants, there can be no manner of doubt, and that individual or collective rights are clearly defined by tribal or communal law is equally obvious, as demonstrated by our previous intercourse with similar races and the knowledge we already possess of the ethnography of the Papuan. These conditions being carefully considered, the problem most affecting the welfare of the country is the effective operation of the necessary conditions for the proper control of the native estate, presumably held in trust by the Government of the country for the rightful owners. This is a matter rightly within the scope of geographical inquiry, as materially bearing upon the commercial

conditions of the territory. It is from the products of the soil that we may look for remunerative results, and the application of the necessary agencies for the economic utilisation of the materials essential in yielding these products is of vital importance to mankind. To drive the natives off their own property and utilise their heritage to our own profit would be a gross violation of principles, and a mockery of British justice, leaving us guilty of acts of rapine of a more extensive nature than those with which we charge the savage Papuan.

The villages in this part of the Possession are of two classes:

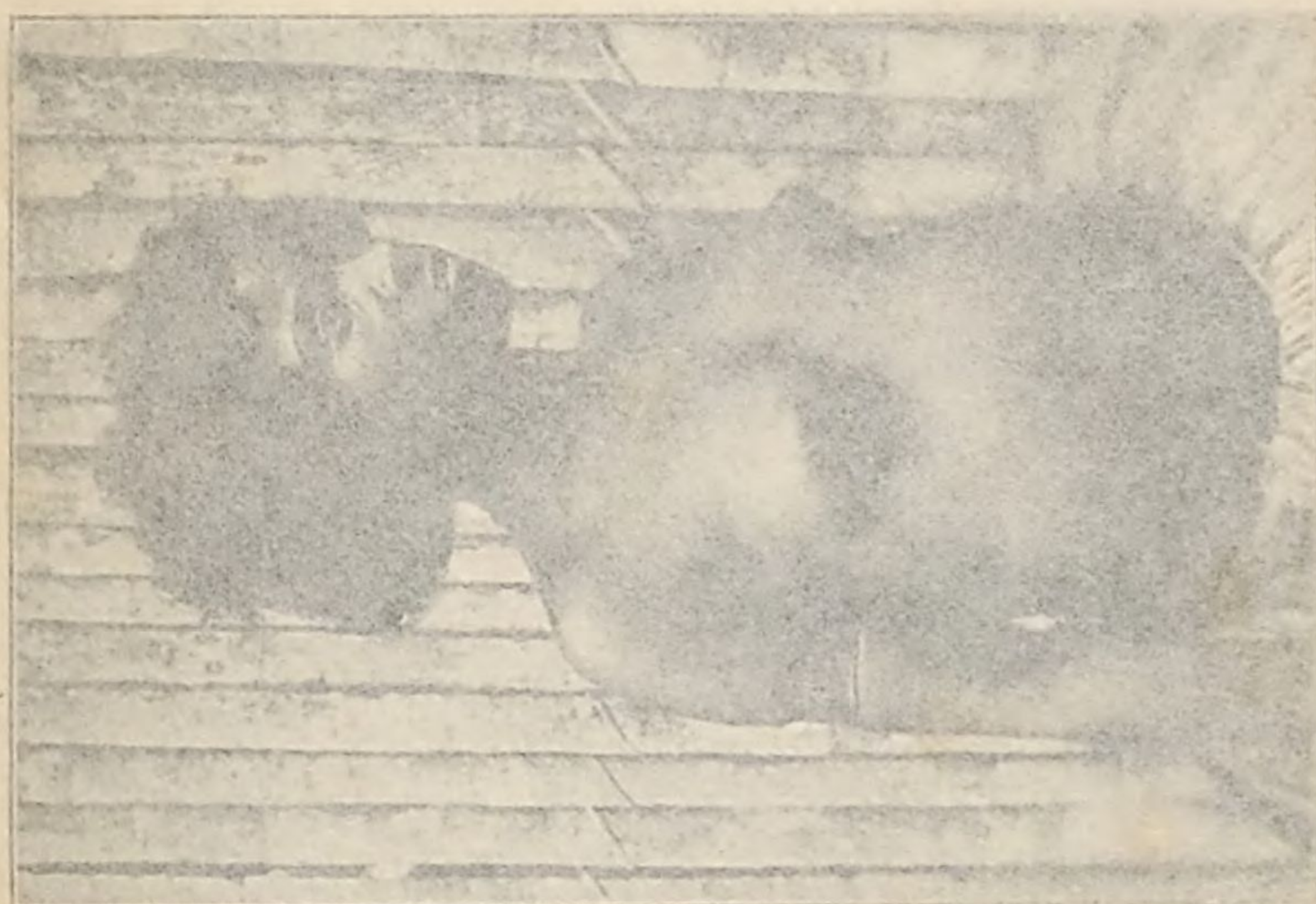


VILLAGE OF KAPAKAPA.

those on the seashore, and on selected sites of the highlands, usually hill-tops affording good drainage and commanding favourable aspects of the country. Of the former class, the large villages of Tupuselei, Kaile, Hula, and Kapakapa are constructed of a number of dwellings raised upon long piles in the sea, from 100 to 300 yards from the beach, encompassed by water of varying depths. Some of these houses are surrounded by fences, and accessible by primitive steps,



MISS MARY



MISS MARY

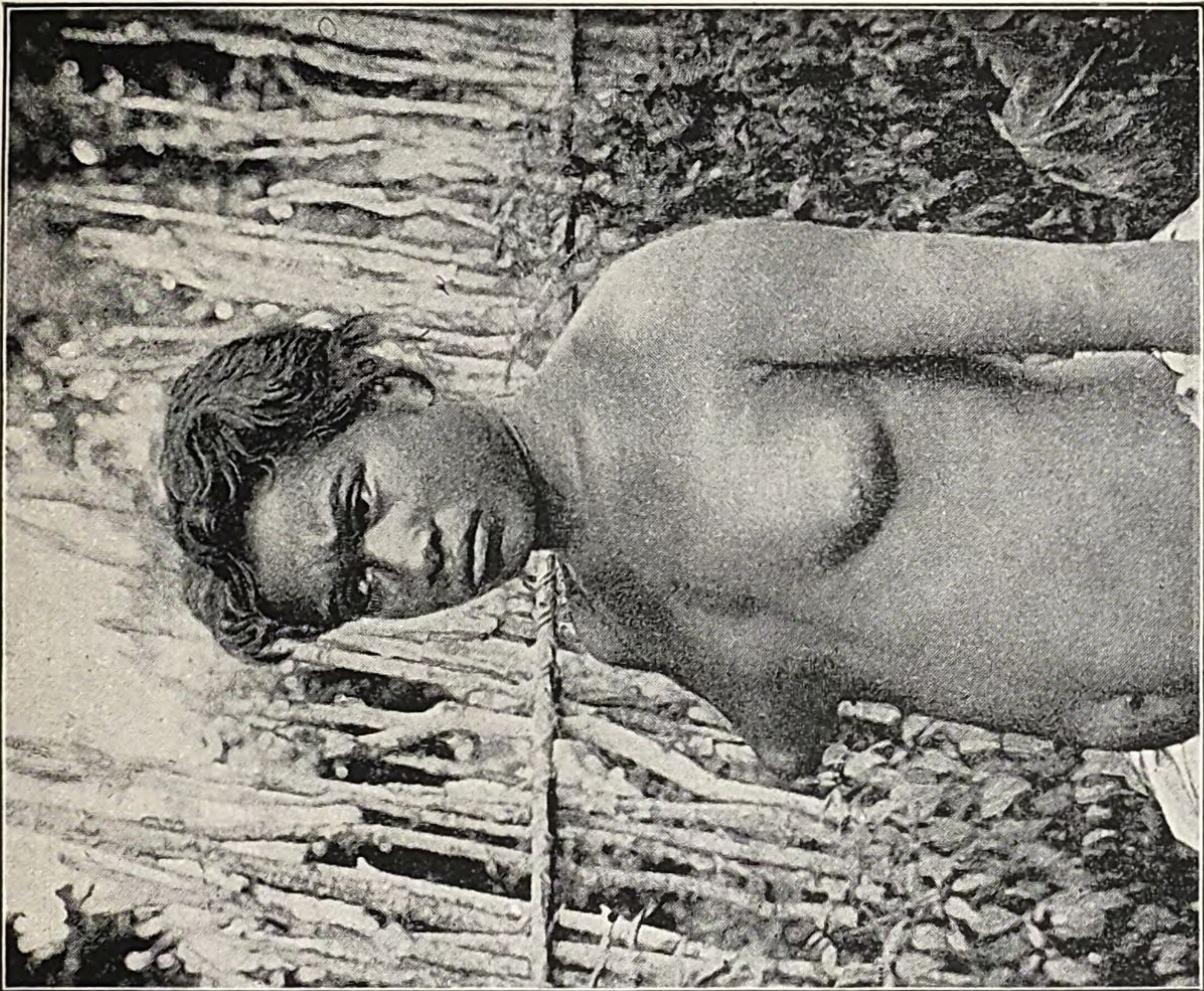
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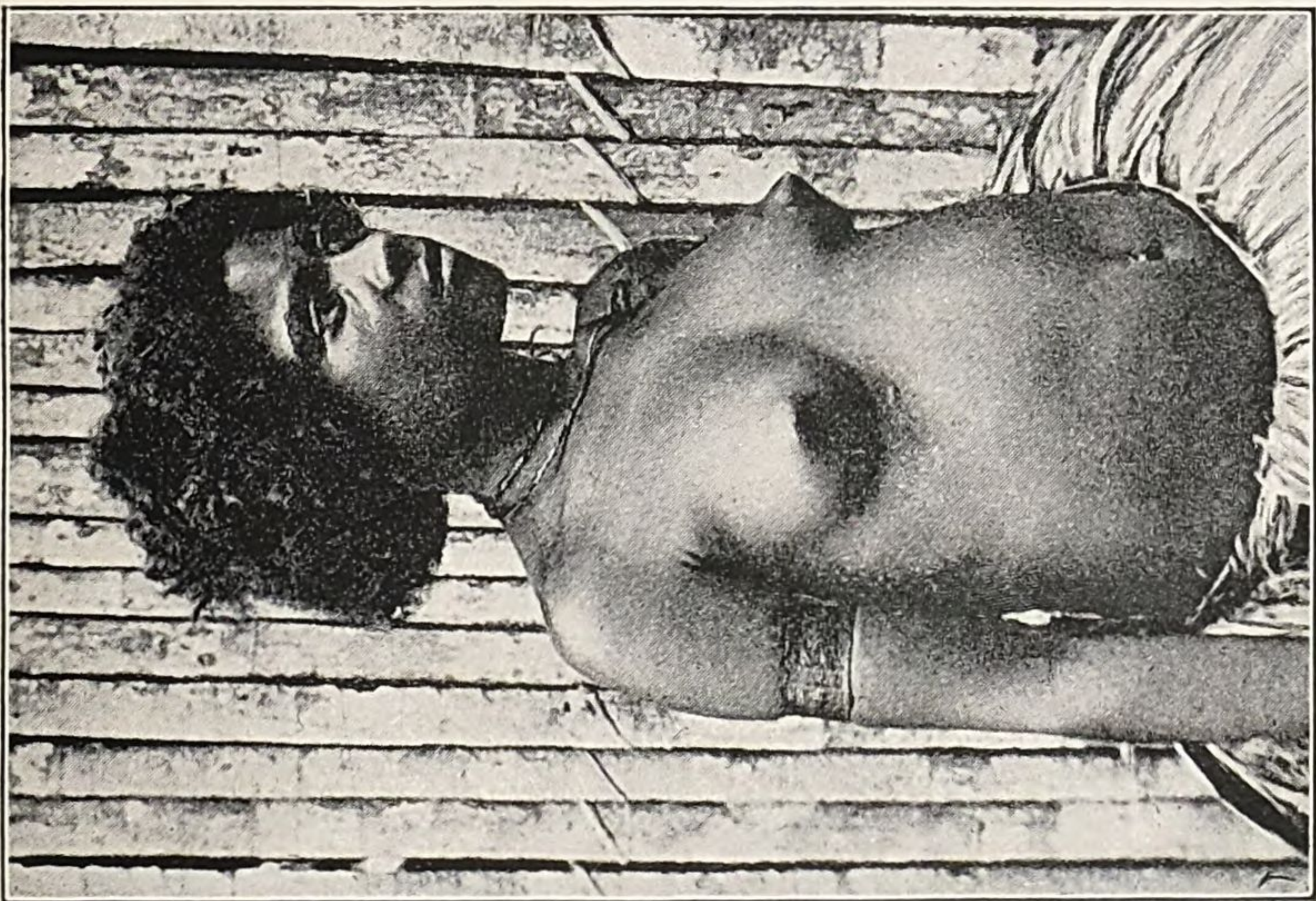


C.V.

...of the highlands ...
...favourable ...
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...constructed of a number of ...
...from 100 to 300 yards from the ...
...of varying depths. Some of these ...
...accessible by primitive steps.



HULA WOMAN.



SUAU WOMAN.

while others are unprotected, and present most curious architectural forms, with their grotesque top structures perched upon long stilts. The whole of the inhabitants of the region are located in villages which form separate centres of organisation, either as distinct tribes with individual dialects peculiar to themselves, or as separate communities with vested interests in common, and affiliated only by ties of connection contracted between opposite sexes. Chieftain magisterial authority is apparently not recognised, although in some villages there are certain individuals who, probably by virtue of seniority, or other considerations not clearly defined and not yet understood, exercise considerable influence.

Occupying an area of about 1000 square miles, the population of this region probably numbers about 14,000 inhabitants. The principal villages, with their estimated population, are: Garia, 3000; Rigo and Sarua, 4000; Kalo, 2000; Hula, 1500; Quaipo, 1000; Kerepunu, 1000; Babaka, 350; Kaile, 300; Tupuselei, 300; Kamale, 100. The Kalo people are without doubt the most powerful tribe of these. Probably encouraged by past successes, and emboldened by their boasted skill in savage warfare, they were not disconcerted at the approach of European visitors, being anxious to maintain the honour of the tribe and revive the memory of their heroic exploit some years previously, when their heathen instincts prompted them to engage in open fight with the crews of two of Her Majesty's war-ships.

The head-man of Gosoru, a village containing twenty-two well-built houses in a pleasant position along a narrow ridge, Keboka by name, is chiefly famous as a great traveller and explorer. Clever, active, and energetic, he is probably between forty and forty-five years of age; undemonstrative and pacific in his movements, he will no doubt prove himself friendly to Europeans, and useful in the development of the country. Keboka took part in Mr. Cuthbertson's expedition to Mount Obree, and accompanied Sir William MacGregor's expedition to the top of the Owen Stanley range, in addition to which

this intrepid Papuan traveller has visited all the villages scattered over a wide area of British New Guinea territory. Keboka's village is remarkable for its peaceable relations with neighbouring tribes, and its apparent desire to enjoy a pacific existence.

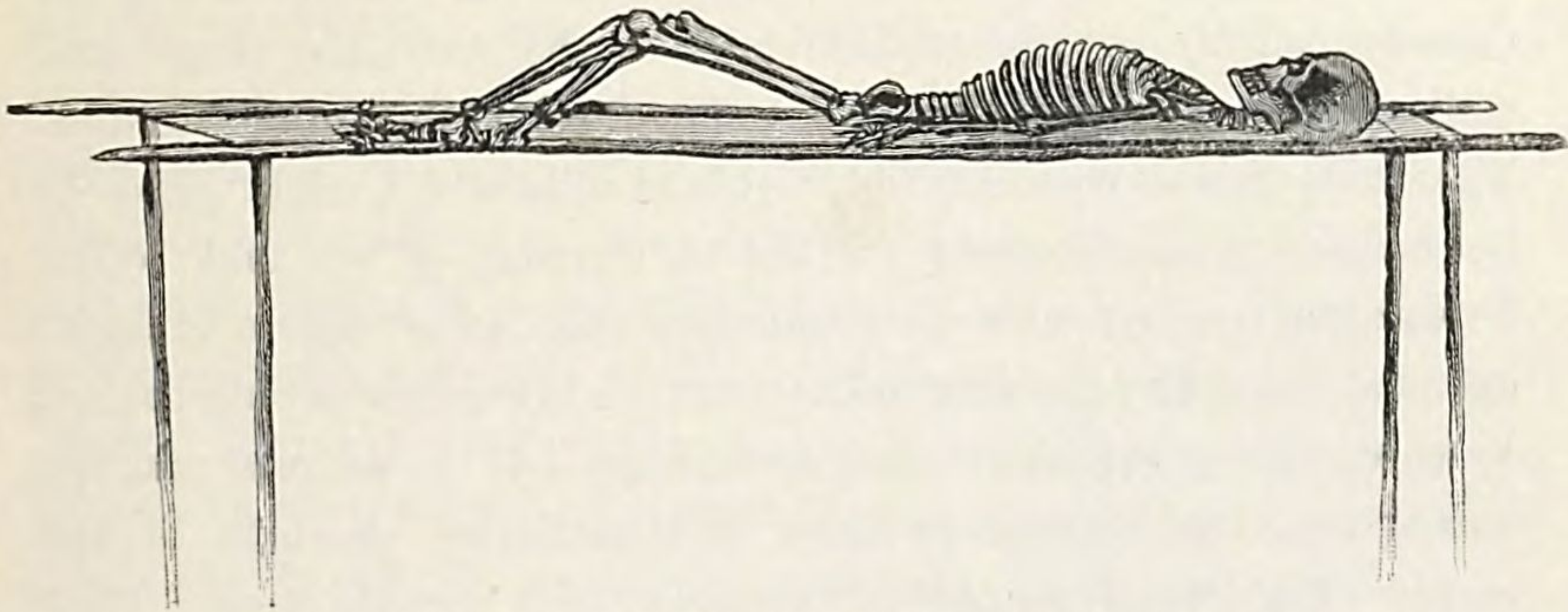
The village of Garia, situated about four miles from Gosoru, is constituted of about fifteen houses, located upon a hill-top of about 2000 feet in height. The relations of its people with neighbouring communities were satisfactory when the village was visited by Sir William MacGregor; but the instability of their natures, and the turbulent characteristics of their immediate neighbours, were not considered favourable auguries for a prolongation of tranquillity. The country they and the people of Gosoru inhabit, although very favourable for pastoral occupation, is not specially adapted for agriculture. The northern limits of Garia are bordered by forest, which extends to the crest of the main range.

Quaiporopu, the chief centre of organisation of the Quaipo tribe, is situated on the crest of a hill about 1000 feet in height, some five miles from the seashore. The village contains about forty houses, and the people, although possessing an inferior physique, are so pugnacious and aggressive as to be held in dread by all other neighbouring tribes. Occupying an area of about thirty square miles, they possess a few minor villages of insignificant proportions scattered over the face of their territory. When not engaged in actual warfare they meet the people of Kerepunu at a market-place, on neutral ground, for the conduct of commercial transactions.

Amongst the centres of population in the neighbourhood of the Kemp-Welch the village of Sarua is not the most insignificant. Containing about fifty houses, erected upon the slopes of a narrow ridge, the crest of which forms a pathway between the lines of dwellings, the natural advantages of this village are very considerable both from a sanitary and strategic point of view. The spiritual welfare of the inhabitants was promoted by a missionary teacher, who has subsequently withdrawn, but whose influence upon the

youthful section of the people was sufficient to enable them to raise their united voices in some verses of hymns. They are addicted to the loathsome practice of disposing of their dead without covering, upon hurdles, sometimes in the bush, but more generally alongside the dwelling of the deceased. The remains are left fully exposed to the action of the elements until nothing is left but the bare skeleton, which is then removed and deposited in a rocky crevice or in the hole of a tree. They are apparently slaves to witchcraft, and their innate belief in its vagaries stimulates them to engagements in warfare and to acts of violence.

The Government centre of organised effort in this section of



SKELETON OF NATIVE, SHOWING METHOD OF EXPOSING DEAD BODIES.

the territory is at Rigo, where about fifteen acres of land were purchased from the natives for the site of the station occupied by the Government agent, who is invested with the magisterial powers for provincial affairs, whether affecting European or native. The purpose of this crown land is to support the station by the products obtained through efficient cultivation of the soil.

The native village of Rigo rejoices in houses to the number of about forty, of which only three-fourths are in occupation. Formerly a South Sea Island teacher attached to the London Missionary Society was stationed here; but the fruits of his labours have apparently not been satisfactory, judging by the social condition

of the people, who confess candidly their inattention to spiritual matters.

The native villages in the neighbourhood of the Government station are somewhat concentrated within a limited area. Thus the village of Kemaia, although inhabited by a distinct tribe, is only about two miles from Rigo. The houses there, about twenty in number, are well built and arranged along a ridge in two divisions, with a road between. The people exhibit a shadow of susceptibility to missionary influence, brought about by the occasional intercourse with the former Rigo missionary teacher.

The villages inhabited by the hostile savage Manukoroites, already referred to, are advantageously located within the confines of a broad dale formed by two forest-clad spurs of the Astrolabe range, and well watered by copious rainfall and permanent mountain streams. The whole district possesses rich highland soils, which might probably be utilised advantageously for the cultivation of tea and coffee. Probably impressed with the advantages afforded by their mountainous position, they derisively characterise the inferiority of their coastal brethren in contemptuous words and actions, and the national practice throughout the Papuan territory of conciliatory offerings to the aggrieved is deemed altogether unworthy their consideration. They treacherously fall upon their unfortunate neighbours, and slaughter inoffensive people, but never offer indemnity. As distinction can only be obtained by the ruthless massacre of human beings and the shedding of blood, young men are usually bold, aggressive, and aspiring, their youthful impetuosity making their presence at all times dangerous. After successfully slaying their victims, they are publicly anointed with oil, decorated, and fêted in the village square.

After the intelligence had reached Port Moresby of the murder of the Seme woman and children by the Manukoro tribe, Sir William MacGregor, with a small expedition of four armed men, subsequently supplemented, left the seat of government in March 1889, and proceeded to the tribal district of Manukoro, for the

purpose of investigating the circumstances connected with the massacre, and to punish the guilty party. From the village of Kaile messengers were despatched to apprise the Manukoro people of the approach of the expedition, and to request the attendance of the head-man of the tribe. After a little trouble, Diomarava, the chief of the Manukoro village of Maniki, appeared at Kaile ready to march with the expedition to his people. His previous intentions, however, appeared to have undergone some slight modification. When the expedition was ready to start, he showed a decided preference for going on before alone in a canoe; but, his movements being observed and his intentions understood, he was not permitted to depart alone, but embarked with the party, which voyaged by sea to that part of the coast line nearest his district. Arriving there, it was considered expedient to direct Diomarava to precede the expedition to the village of Maniki. After allowing that personage a lead of half-an-hour the whole party commenced the march, which extended about eight or ten miles towards the interior. The country passed through consisted chiefly of dense scrub and grass-covered ridges. Maniki possesses about sixteen houses, situated on the higher slopes of a steep ridge, and packed closely together by reason of the limited area available for building purposes. It is accessible by an ascending path through dense reeds and scrub, which would be of great advantage to hostile movements.

On arrival the expedition found Diomarava waiting under the house at the upper end of the village, in company with four or five men; but excepting a few women, no other villagers were seen. Being asked the whereabouts of the people, no satisfactory answer was vouchsafed, but it was conjectured that the friendly cover of the surrounding scrub could have afforded the necessary information. During the progress of lunch the village began to show signs of additional diminution, and shortly afterwards it became known to the expedition that the three men wanted were present. From the movements of the people it became apparent that the

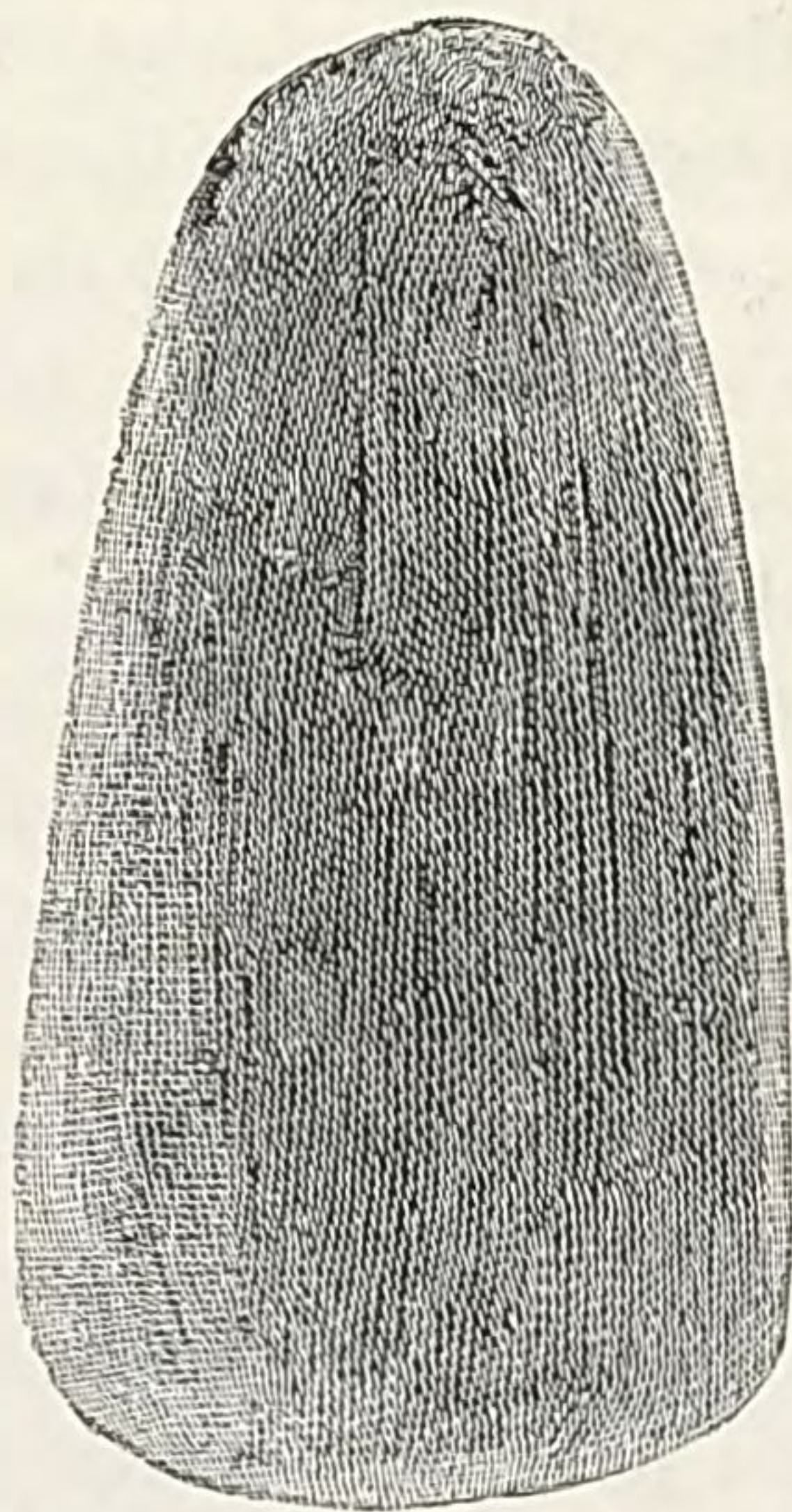
chief, while acquainting those of his immediate friends unconcerned, had not apprised those most likely to be affected by the object of the expedition. For these reasons the exercise of great caution in approaching the three criminals was rendered all the more necessary. Accordingly two native constables of the Rigo Government Station, and one Kaile man, managed to occupy a seat alongside the unsuspecting individuals, and at a given signal, previously arranged, each officer seized his man, and pluckily held on till assistance was rendered, while the remainder of the expedition was prepared to resist any hostile movements that might possibly have arisen through the excitement of the moment. Happily their aid was not required; the prisoners struggled most violently, and used every means in their power to escape, but the handcuffs were quickly placed upon them, when they made most plaintive appeals to their friends for succour, and implored them to procure a pig to offer as a ransom. After their capture had been effected, loud lamentations of sympathisers were heard from the hillsides, occupied by other villages of the Manukoro tribe. Manifestations of apparent grief were everywhere observed amongst these wretched people. One woman followed the expedition for a mile from the village, weeping and wailing bitterly; farther on a man rushed forward with a shell armlet, to offer as a consideration for the release of the unfortunates, while at an advanced section of the line of march a man was sitting weeping, in a position favourable to obtain a last glimpse of the culprits, who were conveyed to Port Moresby, tried before Chief-Justice Winter, and sentenced to death.

Whilst the prisoners were lying under the death sentence a petition was drawn up praying his Excellency the Administrator to exercise his prerogative of mercy in their case. The terms of this petition, however appropriate they might have appeared to religious sentiment, or to interested motives, were illogical and based upon assumptions unsupported by facts. To state that the "Manukoro women and children would as certainly have been killed by the

Veiburi had opportunity offered" was the essence of assumption, and altogether as unwarrantable as the preceding assertion, "that the poor woman and children killed at Veiburi were as truly victims of war as scouts in any European war," was fallacious. To state that they were victims of war when no war existed, and when war could not have been practicable with an almost extinct tribe, was ludicrous. Notwithstanding, this assertion is followed by the statement that the murderers were sent forth to avenge the death of their parents, caused by the Veiburi people "in the boyhood of the prisoners."

The entire population of this part of the Possession is generally healthy, excepting for the usual malarial fever, from which the natives are almost exempt. No endemic diseases were apparent at the time of Sir William MacGregor's visit. The people are evidently slaves to the consumption of tobacco, and are always eager to trade for that commodity. Knives and hatchets are also in demand, although of the latter their requirements are very small, as they prefer the stone adze for hollowing their canoe logs.

Previous descriptions have been somewhat misleading as to the progressive state and general condition of these districts, so much so that the actual existing condition, compared with former official reports, indicates an apparent retrogression; however, such is not the case. The facts are that previous intercourse has been confined almost exclusively to coastal villages long accustomed to European influence, and that the conditions of inland villages *not seen* were assumed to be the same as those actually visited. A similar condition of affairs probably exists in other parts of New Guinea.



STONE ADZE.

Of the general geographical character of this region little can be said with any degree of certainty. Specimens of rocks were obtained from localities bordering upon the lower waters of the Kemp-Welch, but it may be doubted whether they are true representatives of the leading features of the region. Of these specimens Mr. W. A. Rands, Assistant Government Geologist of Queensland, to whom they were submitted for examination, says: "From Quaipo there were some pieces of coralline sandstone, also a piece of limestone containing what appeared to be the badly preserved cast of a spinifera. The other specimens were chiefly either pebbles or small pieces of quartz, jasper, obsidianised quartz, and limestone. There were also several pieces of oxide of manganese in a hard siliceous matrix." The village of Rigo furnished "a decomposed granitic rock, consisting of large crystals of orthoclase and oligoclase felspar, hornblende, and magnetite." Indications of iron were observed in several places in the Rigo district, and specimens of plumbago of good quality were obtained scattered over wide areas within the district. This mineral is used by the natives for the ornamentation of their faces. From the general appearance of exposed surfaces, not based upon examination, the plumbago deposits may prove of considerable commercial value.

Leaving the lower regions of the Kemp-Welch basin, to which the foregoing remarks have been chiefly confined, we are guided to the central and upper sections, embracing the southern slopes of Mount Obree and the mountainous country through which the central waters of the Kemp-Welch and its numerous and interesting tributaries flow. The Kemp-Welch may be described as a comparatively shallow, rapid stream, draining the southern slopes of the Obree range and the rugged country between it and Hood Bay, into which it disembogues. It is fed by numerous tributaries, some of which take their rise from the mountainous country at the back of the Astrolabe range, near the head waters of the Laroki River, from which, indeed, it is separated by only a comparatively narrow

range. Other divisions have their origin in the rugged and precipitous spurs of Mount Obree, from which they leap and career over falls, cascades, successive rapids, roaring, tossing, and foaming with great impetuosity to the lower levels. The name "Kemp-Welch" is applied by European travellers to the main course up to its bifurcation on the eastern side of Mount Pasco. The most important affluents have received European appellations by previous travellers, so that the original native names nowhere appear upon the map of this important and interesting watercourse. This disregard of the native nomenclature is, in the interests of geography, much to be regretted. However pleasant these European names may be to those whom they may concern, their introduction and application to clearly defined physical features of that part of the country inhabited by an aboriginal race is most inappropriate; however, as this question will be referred to in a subsequent chapter, nothing further need be said in this. The banks of the upper tributaries on the spurs of Mount Obree are precipitous, especially where encroached upon by mountain escarpments, which in places abruptly terminate in perpendicular faces.

The geological character of this section of the river-bed is chiefly represented by huge boulders of slate and granite, with which are associated numerous quartz veins. The hills, mountains, and ridges are covered with forest and dense vegetation, and the whole face of the country, south from the Baron Mountain to the river, is of a rough and broken character. The soil, which is dark, loamy, and granitic, is very fertile, both on the river-margins and the hill-sides, where there is an abundant rainfall and moisture-laden atmosphere.

One remarkable feature in the Obree region is the almost continuous pervading mist, which adds largely to the discomfort of travellers, and constitutes a serious obstacle to exploration. During the hours of the night dense curtains of vapour settle down upon

the lower regions, where a very considerable percentage of their moisture is deposited upon the luxuriant vegetation; in the early morning, under the influence of the sun, the mist gradually ascends until the tops of hills and mountains are completely obscured thereby.

The southern slopes of the Obree range are fully occupied by a large population of various tribes of natives, inhabiting numerous villages scattered over the crests and slopes of the numerous offshoots of the range. Choice village sites are hill-tops overlooking the most precipitous faces. These villages are usually approached by winding paths through dense jungle. Like their coastal neighbours, they are hostile, warlike, and addicted to tribal feuds of the most flagitious character. They are apparently never at peace with their neighbours; always on the alert, they display considerable knowledge in strategic movements, especially in manning the fortifications of their villages in an attack. The village approach is usually protected by a strong high bamboo or sapling fence, tied closely together with forest vines, with a small opening in the pathway just large enough to admit one person. In addition to these defensive artifices the large trees on the hill-sides are natural superstructures for watch-houses, if they may be so named, with platforms in front. Here the munitions of war are always kept, so that nothing may be wanting in the event of surprises. When hostile movements are indicated, the women and children hie themselves to these tree outposts, whence material of war in the shape of great stones is hurled down by the women upon the assailants, and from this effective point of vantage great havoc may be wrought in the ranks of the enemy. These village defences, apart from further investigations, are sufficient in themselves to demonstrate the social conditions of these primitive children of nature.

The tribe inhabiting the country near the union of the Margaret and the Ormond Rivers is physically a fine class of people, and apparently pacifically inclined. "They wear armlets, anklets, and

belts of human hair, and they plait fibre in their hair, which hangs in long pendants to their waists.”¹

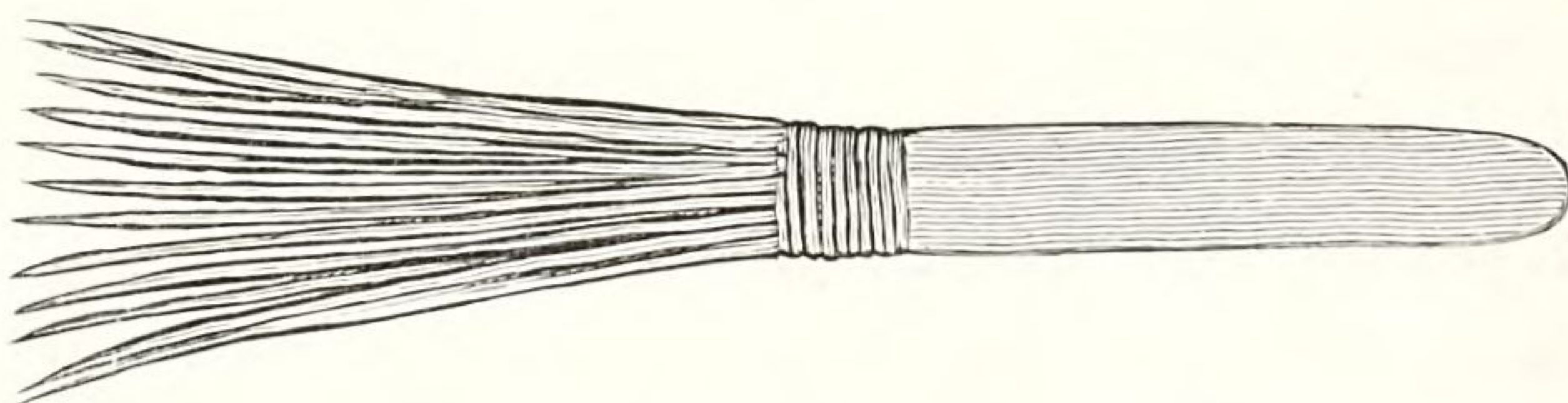
The Kopoela villagers, near the confluence of the Alice Gordon Creek, bury their dead in small enclosed houses, which are specially provided as dead-houses for the use of the village. This institution of burying the dead was a remarkable and singular feature in this village, as others in proximity thereto adopt the barbarous practice of exposing the remains of the human body upon platforms after the fashion of the people on the lower Kemp-Welch. Here they also remove the bones of the skeleton from the platform, and deposit them in the hollow trees. It would be interesting to know from future travellers the ultimate fate of these bones. It is probably not yet known whether they are allowed to remain in the tree, or pass through another form. A not altogether dissimilar mode of disposing of the dead obtains amongst some of the western Pacific islands, where the remains of the chief of a tribe are placed upon a platform in a vault underneath the house last occupied by him, and after the fleshy substances have decayed the principal bones are preserved by the near relatives of the deceased. It would therefore be interesting to know if any affinity exists between the forms in use by those widely separated people.

The inhabitants of these parts are slaves to superstition, and all people outside their own circumscribed tribal boundaries they consider their natural foes. The discolouration of the water of streams by natural agencies is attributed to the handiwork of neighbouring tribes, and the results of bad seasons, through drought or other causes, is credited to the evil spirits. The Kopoela tribe suffer from the loathsome form of ringworm so common to Polynesia. They shave the forepart of the head, and pluck out the hairs of the eyebrows and other parts of the face. They use the spear and shield, but do not practise the bow and arrow.

¹ “Exploration of the Highlands of South-Eastern New Guinea.” By W. R. Cuthbertson.—*Proc. R.G.S.A., Victorian Branch*, vol. v., pt. ii.

Some of their social habits are most repugnant to European feelings, especially the abominable practice of destroying the vermin with which their woolly mops swarm. They usually group themselves in detachments upon the surface of the ground, or on the floor of the houses, and absorb themselves in picking out the objects of search. This vile institution seems to exist in many parts of Polynesia, where the writer has observed the practice for many years. There the performance is participated in by two interested subjects, composed more generally of mother and child, but common to all ages and sexes. During the progress of the operation the operator becomes quite excited in the hunt. The most interesting phases of the performance are, however, the bagging and eating of the game.

The forests of the upper Kemp-Welch abound in birds of every



WOODEN HAIR-COMB.

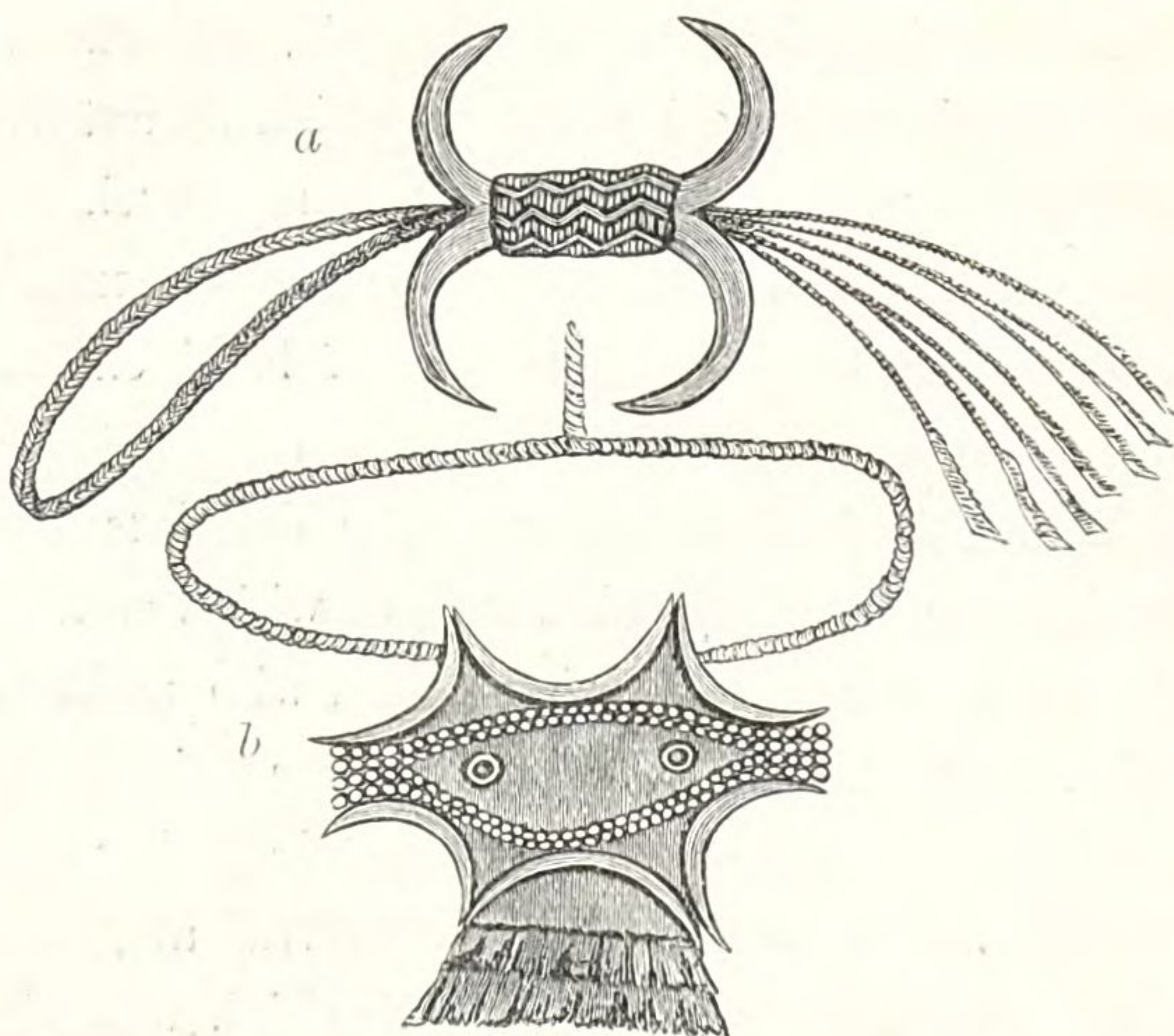
kind, from modest forms to the most gorgeously plumaged birds of paradise and the charming pigeons. The successful capture of these paradise birds is an occupation only to be learned by experience. They usually congregate upon a certain tree called, in sporting parlance, "the dancing tree." Here they meet at a certain hour to exhibit their gorgeous plumage by numerous elegant motions towards one another. Male birds usually possess the most brilliant colours, diffused over the whole surface of their glossy plumage, and appearing as tints of the most exquisite blending. They hop from branch to branch and from limb to limb, bowing and curtsying to one another gracefully and elegantly. The mountain natives make use of a very clever device for catching these beautiful birds by trapping. The most favourable place in the jungle is selected, and a clearing

made, about thirty feet wide at one end and gradually converging to a point like the letter **V**, where it terminates in a framework constructed of saplings crossing one another at intervals, and supported by their ends to two suitable trees. This structure is then perfected by attaching numbers of snares thereto, so placed as to trap the unwary birds in their flight through the tempting opening in the jungle. The skins of these birds, even to the native, possess some commercial value for ornamental purposes. The long feathers of the tails and wings are used for personal adornment, and the shorter feathers for the beautification of spears, shields, and other implements of war. That these beautiful birds are provided by nature with such gorgeousness of plumage for some specific purpose there can surely be no reasonable doubt; whether that purpose be sexual attraction, or is an effect produced by the influence of local environment, we do not venture to advance an opinion.

In addition to the feathered fauna, the districts under review abound in the kangaroo and wallaby, both of which contribute to the domestic comforts of the native inhabitants, who make use of their flesh as an article of food. The hunting of these animals is both interesting and exciting, especially to those participating in the active part of the chase. As is well known to Australians, both kangaroo and wallaby are exceedingly fleet of foot, which necessitates great dexterity of movement in a successful hunt. These hunts are generally conducted by a number of villagers, who drive the animals to close quarters and into strong hunting nets, while on favourable occasions they are speared.

These children of nature are not by any means indifferent to festivity. Their annual feasts consist of two classes, both of which are probably equally important from an epicurean point of view, although differing widely in significance. They are designated the feasts of the banana and the yam. Preceding the latter feast they hunt the kangaroo, the flesh of which is preserved for the occasion by smoking, and during its progress they kill numbers of pigs, with

which they gorge themselves. At this auspicious festivity they dance frantically, the girls nude on platforms, and the men decorated with heathen ornamentations of an elaborate and imposing character, intended to magnify their importance. These feasts continue during the night, and are generally terminated by the light of morning dawn, when the demoniacal yelling succumbs to the overpowering influences of nature. Apart from these biennial rejoicings there are special occasions upon which the noble savages lend themselves



- a. Breast Ornament of Boar's Tusks, sometimes placed in the mouth to produce a fiercer appearance when fighting.
 b. Breast Ornament inlaid with *Abrus precatorius*.

entirely to the exhilarating and voluptuous influences of the social feast, especially after a great victory, or to celebrate the consummation of a preconcerted raid, or a terrible massacre, culminating in practical demonstrations of cannibalism; and also before great contests in the field of battle.

Native festivity is not infrequently accompanied by great privation brought about through scarcity of food. This degenerative social institution of feast and famine unfortunately does not confine

itself to New Guinea, but extends itself over the whole equatorial zone of the Pacific, where the effect of tribal feasting shows itself upon thousands of hungry children and weak, lean mothers, whose only nourishment is derived from the poor substances of wild roots in the absence of the usual cultivated food, which the greed of the men has deprived them of. This deplorable condition need not exist were festivities conducted on a more moderate scale, and were economy of food more generally practised; but frugality is incompatible with the character of the primitive native. Nor is this a vice peculiar to primitive races alone; have we not, indeed, numerous painful examples in our own so-called civilised life?

CHAPTER VI.

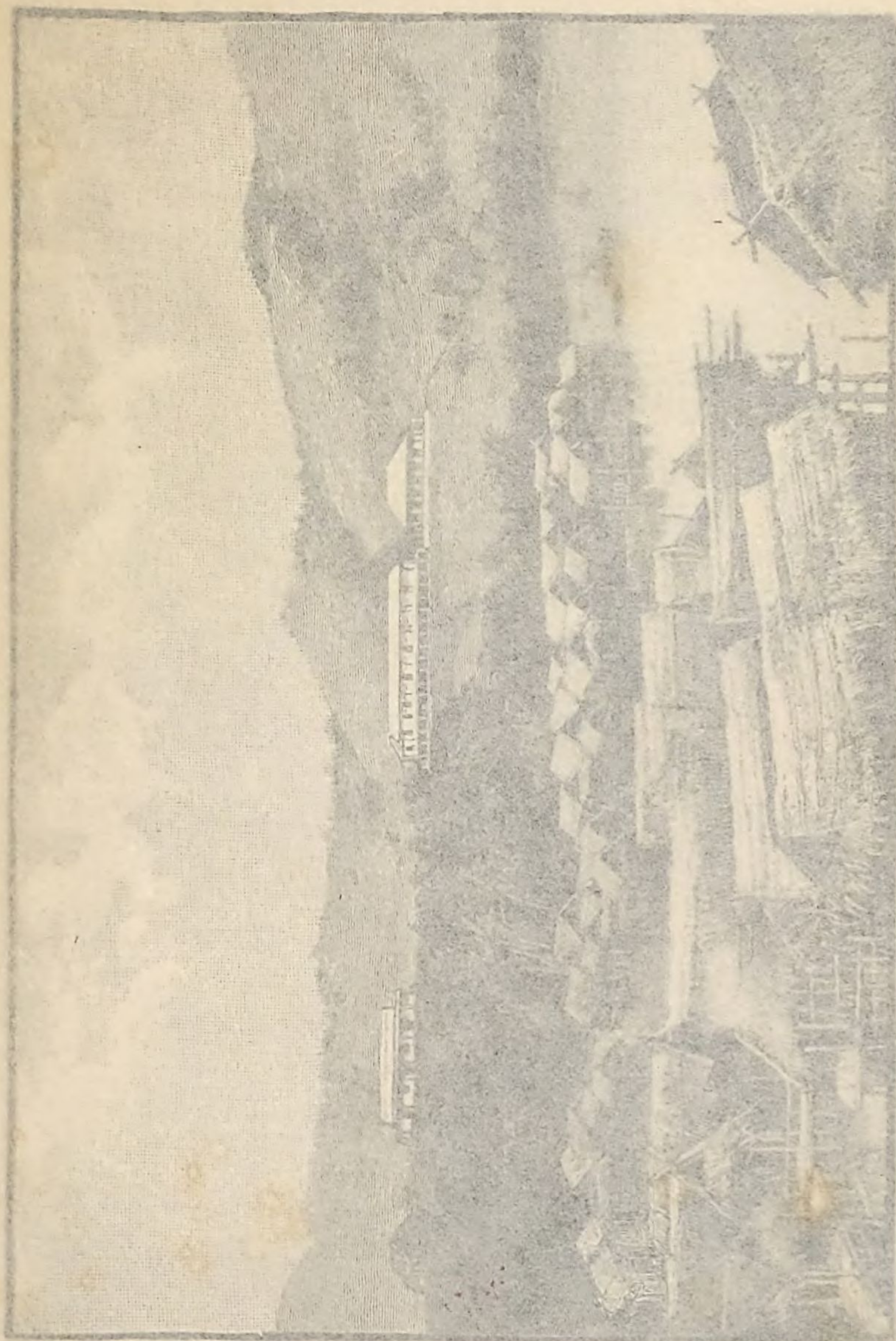
NORTH-WEST FROM PORT MORESBY.

“Let us the land which Heav’n appoints explore.”—DRYDEN’S *Virgil*.

THE subject of this chapter is the general geographical condition of the territory bordering the shores of the Papuan Gulf, within the seaboard limits of the River Aird and Fairfax Harbour. As our operations are generally referred to the meridian of Port Moresby, which may for convenience be designated the initial point, a short description of its chief physical characteristics seems, at this stage, most proper.

Port Moresby is a spacious indentation in the southern coast-line of the British Possession, between Palli Palli Point on the west and Pega Point on the east. The distance between these two points, which is about 11,880 feet, does not, however, represent the actual width of the entrance, which is reduced by the elongated island of Hanudamava, situated close to, and separated from the shores of the West Head by, a narrow channel of about 594 feet wide. The eastern shores of this island, as likewise nearly the whole of those of the Port itself, are fringed by a coral reef, which leaves a clear unobstructed entrance of about 5808 feet in width for free navigation. The two small coral islands of Lolorua, lying off the southern end of Hanudamava, from which they are disconnected by a channel of from two to three fathoms deep and about 790 feet in width, are conspicuous objects in the approach to the Port, to which they contribute a picturesque effect, besides affording additional shelter.

The western division of the Port—named Fairfax Harbour—is



FORT MORESBY.

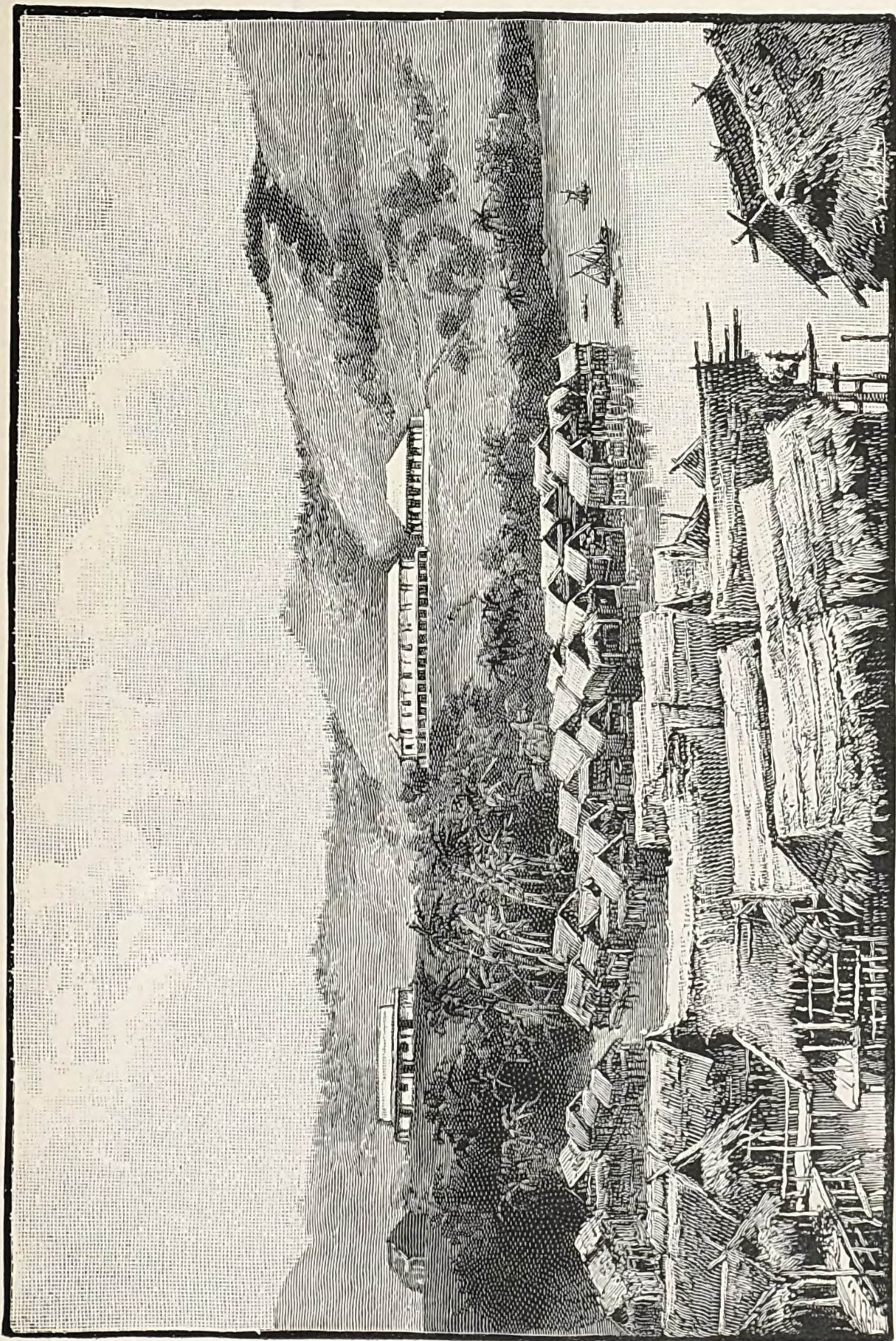
CHAPTER I.

THE PORT OF MORESBY.

The subject of this chapter is the port of Moresby, the territories bordering the shores of the English Gulf, and the seaboard limits of the British Ait and Pait. The operations are generally referred to the harbour of Moresby, which may for convenience be designated the port. The description of its chief physical characteristics is the most proper.

Port Moresby is a spacious harbour, the entrance of the British Possession, bounded by the English Gulf, Pega Point on the east, the English Gulf on the west, which is about 10 miles long, and 10 miles wide, the width of the entrance, which is bounded by the English Gulf, Hanudamava, situated on the west, and the English Gulf, West Head by a narrow channel. The shores of the English Gulf, and the English Gulf, itself, are fringed by a narrow strip of land, the entrance of about 10 miles long, and 10 miles wide, small coral islands of various shapes, and the English Gulf, mava, from which the English Gulf, three fathoms deep, and the English Gulf, objects in the approach, and the English Gulf, picturesque effect, besides the English Gulf.

The western division of the Port



PORT MORESBY.

• specially recommended for the execution of repairs to vessels, owing to its exceptionally sheltered position and the tranquillity of its waters during the progress of the heaviest gales with which the Papuan shores are occasionally visited. The maximum depth of water in this harbour is about six and a half fathoms, and of the Port itself about twelve fathoms. The actual water frontage of Port Moresby, including Fairfax Harbour, along high-water mark is about nineteen miles, and the superficial area of the water surface, exclusive of islands, about nine square miles, circumscribed by the outer edge of the mangrove belt.

The geographical position of Port Moresby is rendered unique by virtue of a remarkable combination of natural causes. It is central, and for that reason, as the capital of what will doubtless be a great colony, its location is probably without rival. With Port Moresby as a centre, and $6^{\circ} 8' 56''$ of longitude as radius, a circle may be described, having the western boundary and Joannet Island, in the Louisiade Archipelago, near the eastern confines of the Possession, tangential thereto. The arc of this circle will pass through Duyphen Point, in the northern territory of Queensland; Cape Della Torre, in the north of the German Possession; Red Cliff, on the northern end of Duportail Island, off the northern coast of New Britain; Long Point; an active volcano of 4000 feet high, named Father; and Owen Point, all on the mainland of New Britain; also between Woodlark and Cannae Islands. An equal tangent circle, with its centre between Capes Buro and Steenboom, would extend its arc to the western confines of the Dutch Possession, passing through Mysol, Dampier Straits, and Way Gion.

Upon the eastern shores of the beautiful and interesting Port Moresby is situated Granville, divided into two sections, designated respectively Granville east and west, containing Government House and the mission station. The public and native reserves are situated in the eastern division, and the Government buildings, Goldie's store, the rest-house, and jetty in the western division. The capital of British

New Guinea is founded upon a hilly site, with the advantage of good natural drainage, easy access to the Laroki River, with its beautiful waterfall, at the back, to which a road has been surveyed, a splendid water frontage to a spacious harbour, with the additional



RANO FALLS, LAROKI RIVER.

advantages of the clean sandy shores of Ela Beach. Having thus briefly referred to the seat of government, we may revert to the operations of exploration and discovery.

About the beginning of April 1889 Sir William MacGregor left the seat of government to inspect the districts westward from Port

Moresby, for the purpose of making himself acquainted with the general condition of the natives and their country. This became necessary—to collect the widely scattered data essential for administrative purposes—and was indeed a duty owing by the State to the natives of the country. Hitherto our acquired knowledge of the geography of the western section of our newly proclaimed territory has been of a fragmentary character; sometimes it has been misleading, sometimes too vague and anecdotal to be of scientific value, and at other times too circumscribed to be of general use. Hence it obviously follows that the physical features, the natural and artificial capabilities of the region, are not unfrequently altogether misrepresented, while the native inhabitants suffer from the attacks of some unscrupulous scribblers, who portray melodramatically the social condition of people whose ways they know not.

Some five miles from the capital lies the seashore village of Borabada, containing about fifty houses constructed upon stilts below the high-water mark, and consequently washed by the turbid waters of the ocean as they meet and recede from the shore. The neighbouring country back from this village is of a hilly character, clothed chiefly by forest of scrub, and other dense vegetation, by which exploration is much impeded, while the belt fringing the seashore is swampy. The available lands suitable for cultivation are somewhat inferior in quality in comparison with the general class of tropical soils, and for this reason the native cultivators frequently suffer much privation through lack of food from the effects of extra dry seasons, which in this district are not unfrequent. Thus the resources of the district, which is not self-supporting, require to be supplemented by imported products from western divisions. This trade is carried on chiefly by means of barter. The people of Borabada despatch annual trading expeditions to the westward with pottery, which they exchange with other tribes for sago, by which friendly transactions they are enabled to tide over the effects of bad seasons. These expeditions are usually undertaken at the time when

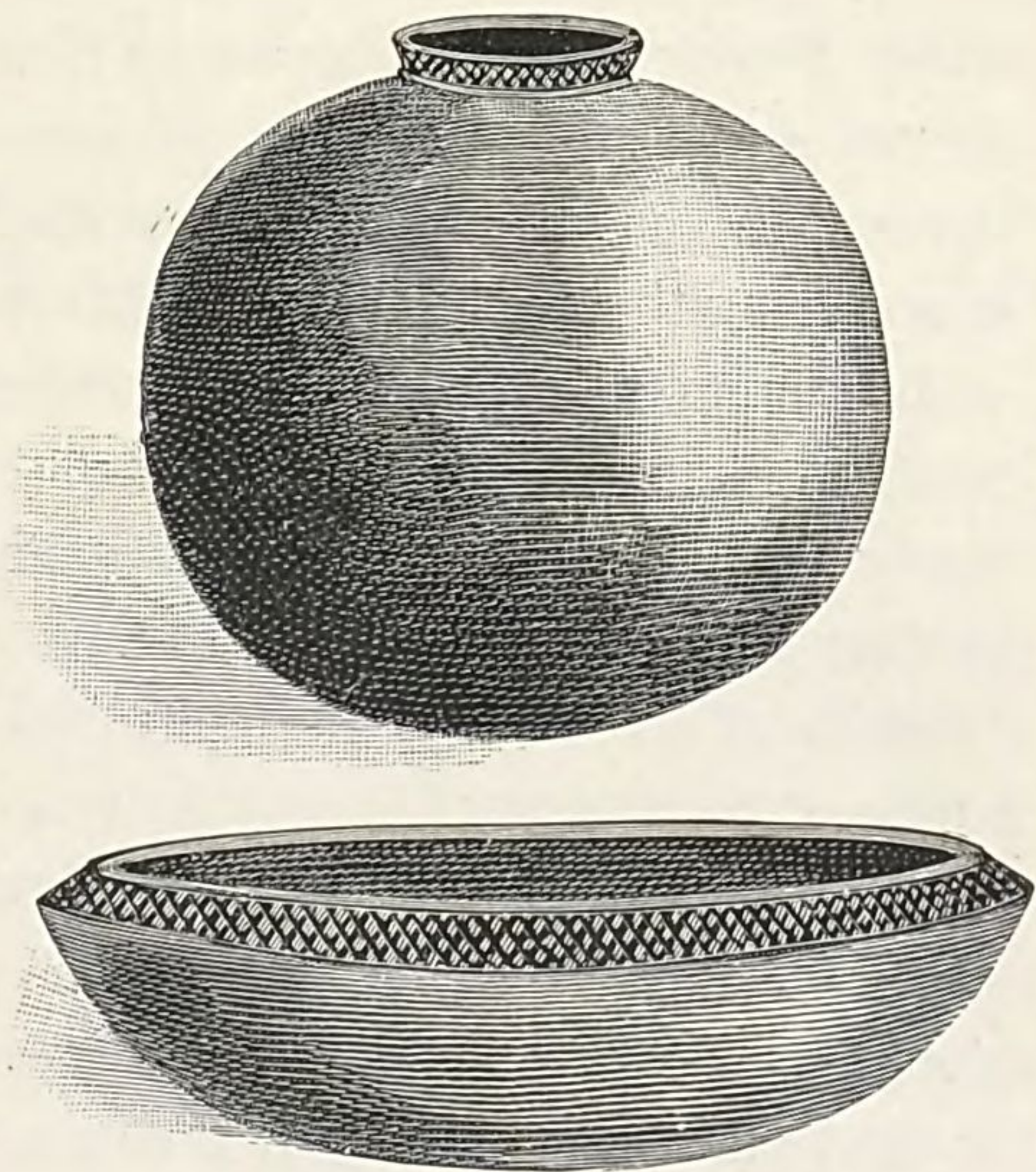
most favoured by the monsoons. Even the few scattered cocoanut palms, with which the town was once beautified, and a hungry people were wont to feast their eyes upon, have succumbed to the dry effects of the climate.

The people appeared free from sickness, and exempt from the *Tinea Desquamans*, which has laid such firm hold upon the inhabitants of the eastern end of the Possession. They are afflicted with yaws, a disease which appears in these parts to assume a periodic character. Similar in general characteristics to the Port Moresby people, they speak the Motu dialect, and are probably a branch of the Motu family. Their religious requirements are ministered to by a native teacher.

Boera village, situated a few miles to the westward, near Red Cliff, is a large centre of population. The houses are substantially built on posts, some fifty yards from the seashore. The low hills, which are the predominating physical feature of the district, are geologically composed chiefly of limestone and flint. Separating these low waterworn hills are flats of good dark soil, which afford excellent planting ground for the native inhabitants; but, unfortunately, the crops frequently suffer destruction by the excessive droughts to which this part of the country is subject. At the time of Sir William MacGregor's visit the people were suffering much from want of food, and as a means of subsistence they were dependent largely upon the banana roots, clams, and fish. More fortunate than their Borabada neighbours, they possess some healthy bearing cocoanut palms, most of which were originally planted by the late missionary teacher, Piri. They also voyage annually to the sago districts of the west, where the clay pots which the women were making are bartered for sago. Their relations with their neighbours and their domestic conditions are of a pacific character, and they appear to recognise the good effects of Christian missionary influence. They are, nevertheless, addicted to the loathsome practice of burying their dead in the village, right in front of their houses.

From Boera Sir William MacGregor proceeded to the coastal village of Manumanu, at the embouchure of the Laroki River, on the eastern side of Galley Reach. Here is located a fragment of the Manumanu tribe, the majority of which, owing to the unfavourable position of the old parent village, have migrated to Morobada, on the western shores of Galley Reach, where a new village has been founded upon a healthy site fully exposed to the cool, refreshing south-east trade winds. Several invitations had been proffered to the remnant occupying the old site to settle in the new village, where the intercourse with a coloured representative of the London Missionary Society could be enjoyed with probable advantage to their social and spiritual welfare; but old time associations, even to the savage Papuan sentiment, have hitherto prevented the entire abandonment of the early home.

The people of the Manumanu tribe, like their neighbours to the east, also suffer from scarcity of food produced by excessive periodic droughts, to which the whole of these central eastern districts appear to be subject. This scarcity of food is severely felt by the inhabitants, who have not infrequently to find a substitute in the rather unpalatable mangrove seeds, which are washed down by the river currents and deposited on the seashore, where they are gathered in small net bags. Notwithstanding the absence of abundant nutritious food, the people are fairly healthy, and do not suffer



NATIVE POTTERY.

from the loathsome form of skin disease which appears to be of general occurrence amongst Papuans. The people often fall victims to the ravages of the alligators which infest the waters of Galley Reach in great numbers. The houses are located on dry land, and erected on long piles from fifteen to twenty feet above the surface of the ground. This method of construction is adopted for the purpose of burning fires underneath the houses at certain seasons, when the mosquito pest is inimical to domestic comfort.

The Manumanu tribe are now enjoying the tranquillity of peace, which formerly was unknown to them chiefly through the hostile nature of the Kabadi people, who occupy the adjoining country to the west. These savages, who were hostile and aggressive, delighted in annoying their neighbours of Manumanu by periodic raids. Notwithstanding their dire experiences of cruel treatment from the hands of their more powerful neighbours, their savage natures showed no mercy to their numerically weaker neighbours of Doura, whom they in turn used to massacre. Intercourse with Europeans and the agencies of civilisation, through missionary influence, have partially subdued the wildest phases of their turbulent natures.

The remnant of the Doura tribe occupies the village of that name situated on the banks of the Veimaui River, up Galley Reach. This river also marks the frontage of an area of some 7000 or 8000 acres of land purchased from the Doura tribe by the Government. This once flourishing tribe originally occupied an area on the Vanapa River, some distance inland, but repeated predatory incursions by interior tribes drove them to the coast. There the Lealea savages massacred some, and drove the others to Doura, where the periodic attacks of the Motu and Kabadi cannibals almost effected their extirpation, which would doubtless have been accomplished but for the timely intervention of the Government.

The chief of the remnant of the tribe, whose history furnishes us with illustrations of the social conditions of early Papuan life, and recalls the characteristics of our ancestors, has attained the

age of about sixty years. His features, and those of his people, likewise the inhabitants of interior villages of this region, were of the Oriental type. Their houses were miserable structures, and the general appearance of their surroundings indicated the presence of an apathetic people, indifferent to order and cleanliness. The children are sufferers from yaws and the adults from ringworm, and some few from elephantiasis. They plant food, for which their land is well adapted. The appearance of small parcels of salt and other articles of native commerce indicated the trade with mountain tribes. Doubtless this owes its inception to and is fostered by their former connection with the interior, and likewise promoted by the mutual ties of a common language, which differs considerably from that of their coastal neighbours, so that periodic expeditions to their commercial friends of the interior will be to the advantage of all concerned.

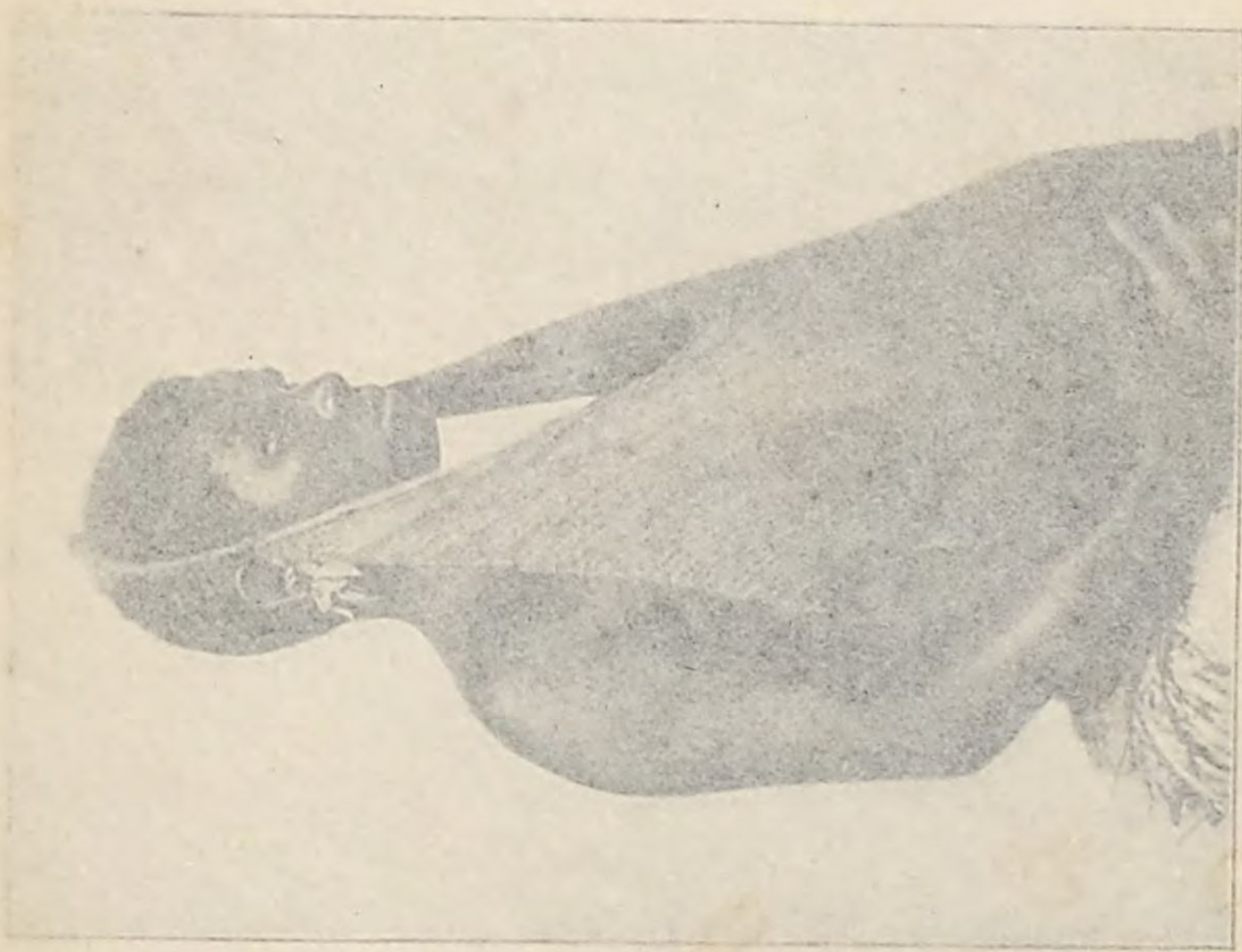
The district inhabited by the Doura people embraces a probable area of about sixty square miles of flat land, consisting of deep alluvial soil, through which flow the waters of the Veimauri River, navigable for some distance by boats. This district is chiefly remarkable for its timber resources, which are important. If properly utilised they would prove remunerative, but hitherto the only enterprisers who have shown interest in the industry are Messrs. Page and Company, who have spent considerable time in the district felling timber.

The neighbouring tribe of Kabadi occupies four villages. That of Hanuabada, the chief centre, contains many houses, which nestle in somewhat scattered order amongst the delightful groves of the cocoanut palm. The village was very clean, and in other respects presented the appearance of having care and attention bestowed upon it. Extensive areas of their land are flat and swampy, altogether unsuitable in its natural state for cultivation; for this reason their planting ground is located near the village. It consists of rich, deep-brown soil, covered with grass, and well adapted for

cultivated products. Formerly these people attained great notoriety for their wild character, shown in predatory raids and cannibalism. However, the youthful section of Hanuabada, under the influence of Timothy, a Samoan teacher of the London Missionary Society, receives such instruction in the arts of modern civilisation as may produce a salutary effect.

From the Kabadi district to Hall Sound the general physical features of the country are of a hilly and undulating character, especially along and bordering upon the seashore, where hills of from 650 to 770 feet high form elongated ridges nearly parallel to the general trend of the coast line, and skirted by numerous native villages both along their interior and exterior bases, with the Aroa River marking their eastern limit, and Hall Sound on the western aspect, at the head of which disembogue the Ethel and Hilda Rivers. In the neighbourhood of these two watercourses the physical character of the country assumes a somewhat different aspect: here the St. Joseph River flows through a beautiful, flat, and undulating country to the immediate neighbourhood of Mount Yule, where it receives the drainage water from the steep, forest-clad slopes of this unexplored mountain, whose lower spurs are inhabited, and whose sombre head rears itself over 10,000 feet above the sea into the dense clouds. This district was visited in 1887 by Mr. Edelfelt, who endeavoured without success to ascend Mount Yule. Through superstitious dread of the unknown mountain regions, and probably through fear of neighbouring tribes, the natives could not be induced to penetrate into the interior; and for these reasons no useful and satisfactory exploration of the locality could be effected.

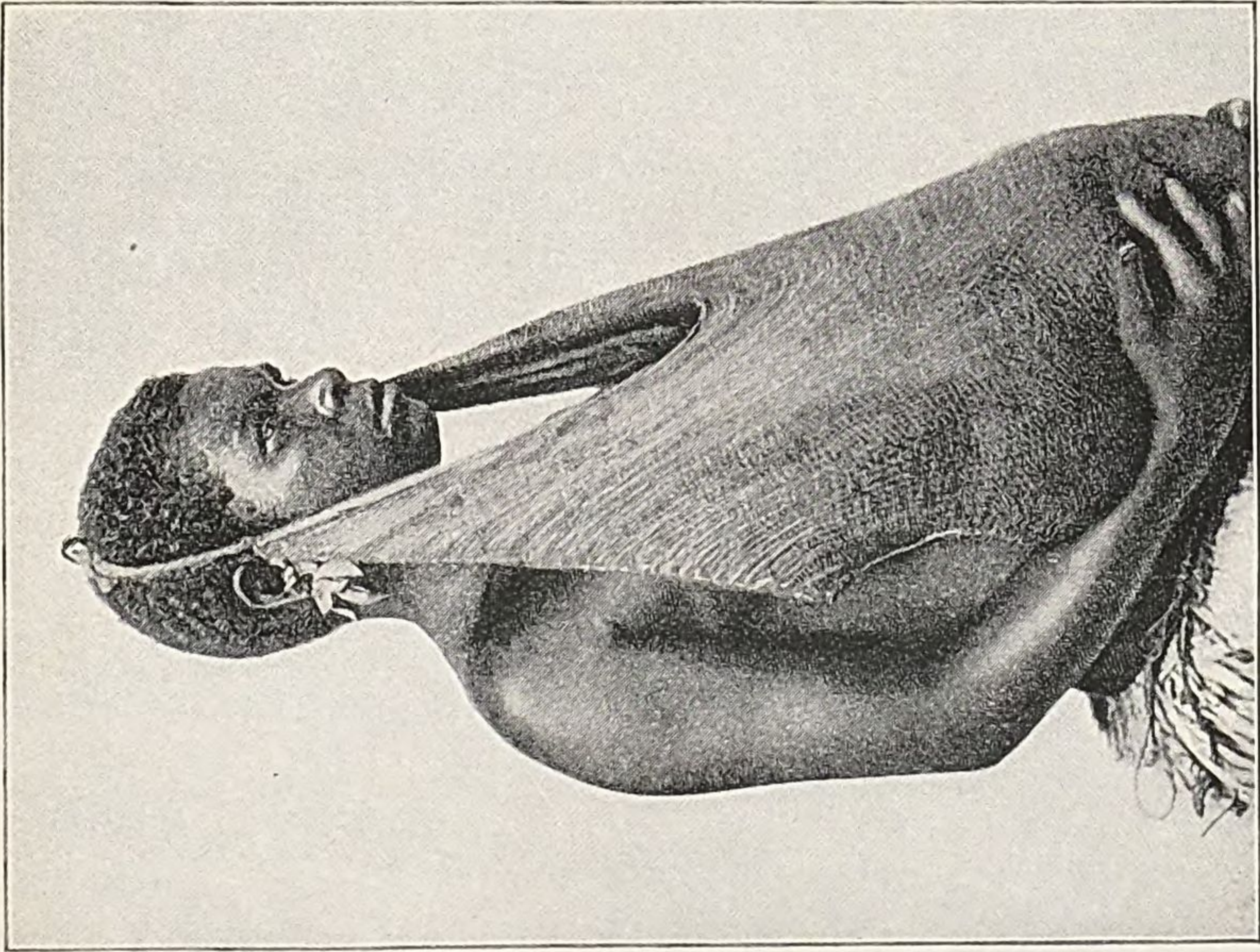
The Maiva and Meko districts, including the St. Joseph's basin, are specially interesting for their adaptation to agricultural and pastoral requirements; the former by reason of their rich, alluvial soils, and the latter by the luxuriance of existing vegetation, with which the surface is clothed. These districts are probably metalliferous, but no systematic prospect has been made, consequently



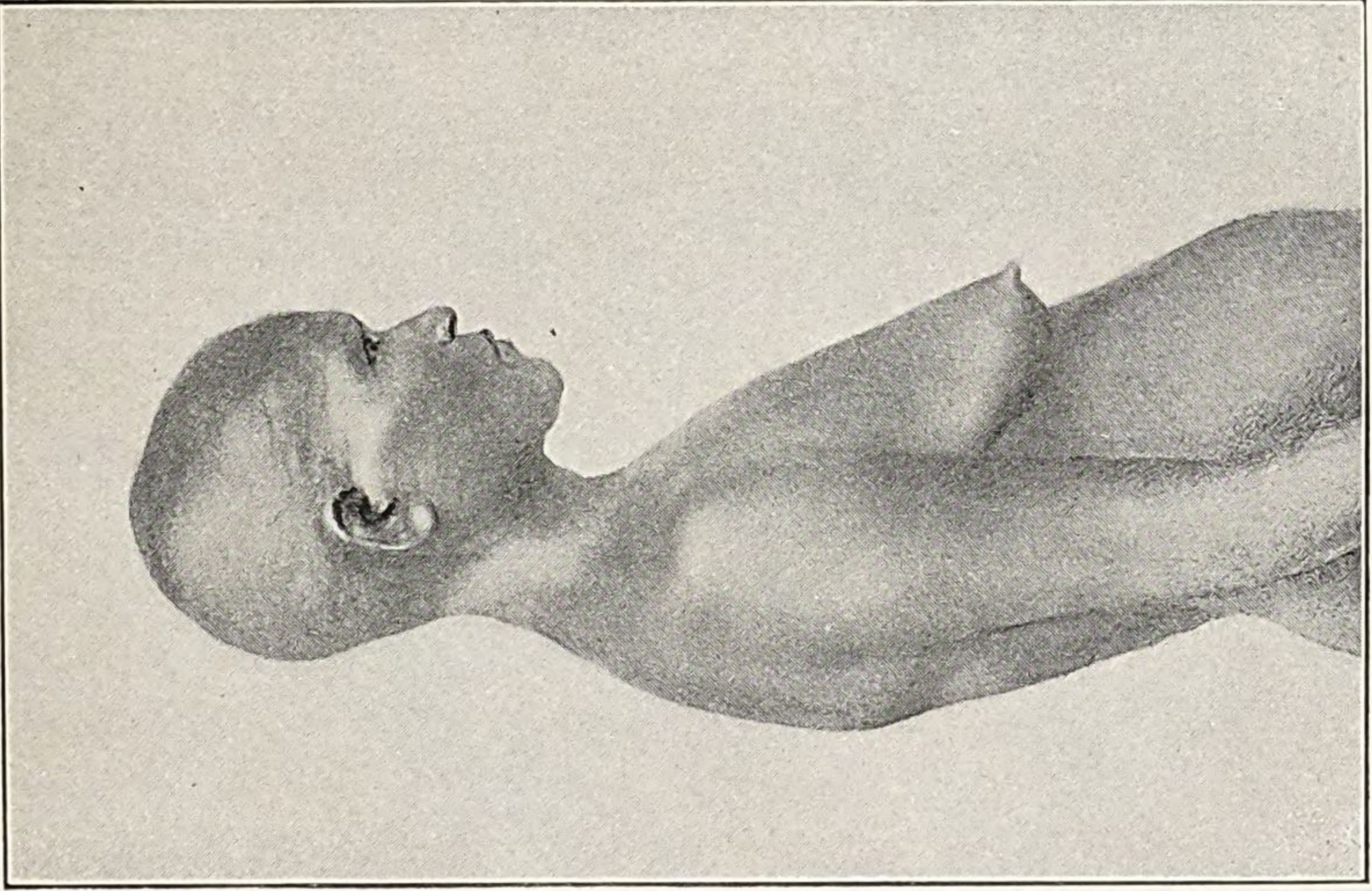
WOMAN WITH BABY ASLEEP IN KIAPA—FORT MORESBY.



MARRIED WOMAN—FORT MORESBY.



WOMAN WITH BABY ASLEEP IN KIAPA—PORT MORESBY.



MARRIED WOMAN—PORT MORESBY.

nothing more than an assumptive opinion is at this time possible. Through the absence of specimens of truly representative rocks, no useful delineation of the geological character of the region can be given, but, judging by some fragmentary specimens, water-worn quartz, pebbles, and slate are present in the beds of watercourses, while iron-stone and slate occur in the surface strata of hills and ridges. Fossiliferous remains of marine origin, of probably recent formation, exist in calcareous beds on some of the hills in the neighbourhood of the village of Maiva.¹ The vegetation consists chiefly of patches of eucalyptus forest, rather of a stunted and scanty character, fine grassy valleys interspersed with picturesque belts of scrub, so that the different varieties of vegetation beautify the face of the country. Part of this region is densely populated by a somewhat superior class of people. They occupy large villages consisting of numerous houses substantially built on piles.

The Meko people are rather light in colour, and possess a moderately good physique, with rather flat noses. Their social characteristics are apparently of a more harmonious order than usually met with amongst the heathen tribes of the country. Although highly superstitious, they are not dangerous to Europeans, and with patient care and attention they might become useful cultivators of the soil.

European energy in the neighbourhood of Hall Sound is centered in Yule Island, which since about 1886 has been occupied by the French representatives of the Roman Church, who are, as elsewhere in the Western Pacific, most devout and earnest in their efforts to promulgate Christian doctrine.

About forty miles of coast line intervene between Yule Island and the next mission centre, which is to the north-westward, on the shores of the great Papuan Gulf. Situated on the Williams River delta is Motumotu, the mission station of the London Missionary

¹ "Notes on New Guinea," by E. G. Edelfelt.—*Proc. and Trans. R.G.S.A.*, Queensland Branch, vols. ii. and iii.

Society: formerly this circuit was subject to the control of the coloured teachers, but lately the Rev. J. Chalmers has assumed personal supervision. From the large villages of Maiva and Maiba to the Williams River, the country bounded between the slopes of Mount Yule and the seashore is of a hilly character, apparently fertile, while the coast line is indented by the Coombes River near One Tree Hill, and Macey Lagoon near the villages of Lese and Cliff Point.

The names Naratu and Williams River are simply appellations bestowed upon the deltaic channels of the Heath River, and, in so far as their geographical significance applies, are certainly misnomers. That the title *river* should in this instance be applied to the tidal outlets of a comparatively small watercourse is just as inconsistent as the absurdity of applying the designation of Kaurefrena River to the estuary of the sea at Port Chalmers, at the most northerly entrance to the Heath. Upon further examination it may, however, be found that this so-called Kaurefrena is either one of the deltaic channels connecting with the Heath at some inland juncture, or else the actual embouchure of a separate river not yet discovered.

The Motumotu district is flanked on the north-western aspect by the Albert Mountains and several hills which skirt its southern slopes. The coast line is cut up by a complete network of tidal channels connecting with the Heath River: these flow round numerous islands or deltaic areas formed by the accumulation of alluvial deposits brought from the higher levels by flood agency. These areas are covered by the cocoanut, sago, and nipa palms, and in places fringed by the common mangroves. The native population is numerous, but pacifically disposed towards Europeans. They are industrious in the preparation of sago from the sago palm, for which the district is famous. This sago is prepared at certain seasons, and used largely in export trade with the Motu natives and other eastern people, who voyage to the west in large canoes laden with pottery, in exchange for which they obtain sago from their Motumotu

neighbours, as already stated. This commercial intercourse betwixt a class of people notorious for their rapacious tendencies must necessarily be favourable to the conciliation of the community and the promotion of legitimate enterprise, both European and Papuan. The intervening country along the shores of the Gulf of Papua, from the Kaurefrena River to the Vailala River, for about forty miles, is yet unexplored, and the meagre hints we possess of the physical features and general conditions of the territory are of no value.

Beginning with the Vailala River, we are, through the explorations of Mr. Bevan and the visit of the *Ellangowan*, made acquainted with the district bounded by the head waters of the Papuan Gulf as far west as the River Aird. This somewhat extensive tract of country possesses many interesting features, both in regard to its general conformation and its natural conditions. Of the former the most remarkable feature is the intricacy and sinuosity of the channels, by which the whole district fringing the seashore is cut into deltaic divisions of various forms and sizes, indented and subdivided by minor estuaries, through which the tidal waters of the ocean ebb and flow. Although somewhat intricate to navigate, these tidal channels may be useful in boisterous weather, when exposure to the open sea might be considered undesirable, and in offering safe waterways to the interior of this little known district.

Australian geographers have long entertained the opinion that access to the interior highlands might be obtained through some of the watercourses disemboguing into the Gulf of Papua, especially in the immediate neighbourhood of the Aird. It was chiefly through the assurance of a probable consummation of these speculative views that the officers of the Royal Geographical Society of Australasia, in promoting and organising the costly scientific expedition to New Guinea in 1885, formulated a scheme for the exploration of the highlands of the island by the Aird River route. Owing to the imperfect knowledge we then possessed of the head

waters of the Gulf and the entrance to the Aird, the original plan was abandoned after the expedition had reached Thursday Island, and local advice had been obtained unfavourable to an attempt to approach the Aird River bar, and the navigation of the Papuan Gulf by a small craft in windy weather. It is thus not infrequently the case that a little knowledge is dangerous, where we either seek to improve our own condition in relation to immediate wants, or to obtain such information as may be useful to others. Had we then possessed more accurate and comprehensive knowledge of the main channel of the Aird River the results the *Bonito* expedition derived from the Aird region might possibly have been wider in range, extending over a newer and more interesting section of country than the Fly River region, to which the operations of the expedition were chiefly confined.

These deltaic areas of the Aird and Wickham Rivers are almost wholly comprised of low, swampy country, covered with dense mangroves, pandanus, nipa palms, and scrub. Back from the salt water limit the general features of the country assume a different character; the contour indicates gradations of higher levels among low scrubby hills of basaltic and volcanic formation, with high limestone ridges skirting the banks of the Aird.

A peculiar feature of this region, which also extends west to the neighbourhood of the Fly River, is the enormous dimensions of the native dwelling-houses. Some of these on the deltaic areas of the Aird are from 50 feet to 300 feet in length, with enormously high front ends, which gradually slope down to the rear end somewhat after the shape of a wedge. The height of the front entrance of some of these houses has been estimated at about 75 feet; they are usually provided with a raised platform, to which access is obtained by inclined sapling stems, up which it is necessary to scramble monkey fashion. Some of the villages are very large and populous, usually located in vile, swampy localities, subject to the exhalations of noxious vapours. The houses are generally built upon stumps

which, combined with their peculiar construction, makes them assume a very irregular and unusual architectural order.

The country at the head of the Gulf of Papua is inhabited by a dense population possessing a superior physique to that of the eastern parts of the Possession. In navigating the deltaic channels of the Aird the steam launch *Mabel* entered one of the tributary estuaries, where Mr. Bevan observed the largest native settlement ever seen



AN ELAMO.

in that region. For a distance of two miles the margins of the channel were thickly studded with enormously large houses of about 400 feet in length, and about 100 feet in height, constructed on piles. Here they possessed great numbers of large war-canoes, each capable of accommodating about thirty warriors. The men decorated themselves with grotesque ornamentations peculiar to heathen taste. They are a fine, muscular set of people, with an excellent physique, and of stalwart appearance when armed with bows, arrows, and

spears, which appeared to be their principal weapons of war. They were noisy and agitated at the approach of the steamer, but notwithstanding their maiden experience of steam and the white skins they were not hostile, and their excited demonstrations probably expressed rather novelty than aggression.

The inhabitants of some of the villages of the Gulf region are doubtless addicted to anthropophagy, and one tribe at least to practices upon female captives of the most vile and execrable character. In the large cannibal village of Maipua, visited by Captain Hennessy, the interior of their houses was decorated with human skulls and the skulls of alligators, pigs, and dogs, ornamented with curious designs carved thereon. In one house alone no fewer than 250 human skulls were seen, all arranged tastefully along the dividing partitions of the house. One can only form a vague conception of the vastness of a century's hoarded treasures in human skulls preserved in the primitive anatomical museums of the Gulf territory. The imagination is even more severely taxed when appealed to in picturing the horror of the murderous scenes enacted in these dark regions from time to time. This large village of Maipua, which occupies both banks of a creek, is composed of a great number of houses of enormous dimensions, divided into compartments by numerous partitions, with a central corridor. The inhabitants, who are possessed of good muscular development, rejoice in bloody strife and cannibalism, for which practices they are dreaded by neighbouring communities, and for which their fame is widely known.

At the embouchure of the Panaroa River a spacious harbour exists, to which Captain Hennessy applied the name of Bloomfield Harbour, from which an extensive view of much of the highlands of the Possession may be obtained, especially the Sir Arthur Gordon range and other unnamed features. In so far as we are able to learn from our yet imperfectly acquired data, the Gulf territory appears to enjoy immunity from periodic droughts. The whole face of the

country is clothed with the most luxuriant vegetation, so that the people have an abundant supply of natural and cultivated products, from cocoanut palms, which grow in great abundance, to the annual esculents produced in plantations. The swampy condition of some of the villages renders access to the uninitiated European laborious and uncongenial, while to the inhabitants themselves the constant inhalation of impure air arising from the decomposition of organic substances must be very unwholesome. Combine with this the swarms of insect life, especially mosquitoes, which thrive in swampy localities, more generally in tropical and semitropical latitudes, and we are furnished with conditions which to European life would be most inhospitable, if not almost altogether insufferable. The inhabitants are large sago producers, by which means commercial relations in export trade with neighbouring tribes are fostered.

CHAPTER VII.

ASCENT OF MOUNT VICTORIA, AND EXPLORATION OF THE OWEN STANLEY RANGE.

“Ye realms, yet unrevealed to human sight !
Ye gods, who rule the regions of the night !
Ye gliding ghosts ! permit me to relate
The mystic wonders of your silent state.”

—DRYDEN'S *Virgil*.

THE contents of this chapter, it may be here stated parenthetically, were written and subsequently read by the author, in the presence and under the authority of Sir William MacGregor, at the September 1889 meeting of the Royal Geographical Society of Australasia, Brisbane, at which General Sir Henry Wylie Norman, Governor of Queensland, and Lady MacGregor, were also present.

When the distinguished Captain Owen Stanley viewed his mysterious and lofty namesake from the quarter-deck of H.M.S. *Rattlesnake*, nearly half a century ago, could his imaginative faculties have conceived the enormous expenditure of energy that has of recent years been applied by our gallant British explorers in their endeavour to solve the alpine problems of a mountain range to which the eminent Professor Huxley awarded the euphonious appellation of his brave Captain? The desire to scale the precipitous escarpments of the Owen Stanley range, and to make acquaintance with its geographical conditions in their various aspects, had for some considerable time occupied the earnest thoughts of Australian and European geographers, while large sums of money had been expended in the equipment and maintenance of costly expeditions intended to delineate the unknown features

of the mysterious region, separated from the known and accessible parts of the Possession by a gloomy and dismal-looking hiatus, across which the footsteps of white man had never left an impress. Impenetrable jungles and inaccessible precipices had baffled all previous efforts and crushed long-cherished hopes of sweet success.

Many wonderful stories had found their way into the pages of English and Colonial literature of its awe-inspiring surroundings, and the demoniacal associations of native mythological origin of the Owen Stanley range. Amateur aspirants to distinction in the field of exploration had subjected themselves to the attractive force of the mountain, so that their imagination was so influenced thereby as to be drawn out in elongated form from the paths of geographical science to the boundless fields of romance. This particularly applies to one case brought prominently under the notice of the Australian public by our distinguished metropolitan press, which gravely and significantly announced the successful ascent of the far-famed Owen Stanley range by the late Mr. Hartmann, of Toowoomba, who from the giddy heights of the mighty range had placidly sniffed the breeze from the briny northern ocean with which the far-off shores of the German Possession are watered. Other travellers told of the roaring and ceaseless moaning of mighty cataracts in the mountain face; of the impetuosity of mountain torrents, as they dashed in their wild careering through the steepy gorges to join the more placid neighbouring streams; and of the harassing obstructions and drawbacks, resulting in ultimate failure, through the procrastination and superstition of the native tribes, upon whose resources exploratory organisations in New Guinea were largely dependent.

Viewing all our previous experiences in New Guinea highland explorations, we may reasonably be pardoned for the exuberance of our geographical enthusiasm over the brilliant success attending Sir William MacGregor's ascent of Mount Victoria, the particulars of which we now modestly endeavour to describe.

This expedition, which left Port Moresby on April 20, 1889, proceeded in a boat to Galley Reach, about thirty miles to the westward, where the Vanapa River was entered by one of its openings on the eastern side of the Reach, the position of which had not previously been noticed nor shown on the charts. From its embouchure to the highest limits of tidal influence the banks of the river are covered by dense mangroves, but above that limit they are from ten to twelve feet high, composed of deep, rich soil, studded with ilimo and other large trees. Owing to the presence of numerous snags, the existence of strong rapids, rendered dangerous by the discolouration of the water by heavy rainfalls over the highlands of the interior, and the sinuosities of the river, its navigation was slow and tedious. On the 27th of the same month the main dépôt was formed forty miles by water from the mouth of the river, in latitude $9^{\circ} 7' S$. This position was only attained by laborious struggles with the powerful river current, and an application of the best efforts of the boat's crew.

From about fourteen miles from its mouth the banks of the river are formed by steep forest-clad hills, into whose clayey and slaty formation the careering of deposit-laden waters has cut deep furrows, indicating the passage of ages by grim wrinkles and deep fissures.

No natives were seen near the banks of the river from its mouth to the dépôt by the first section of the expedition, but their traces were indicated by the existence of a cleverly constructed suspension bridge across the Vanapa River, at a place where it is narrowed by the encroachment of a rocky escarpment of the hills. Here a large tree of the banyan variety was found, the trunk of which supports an end of the bridge fifty feet above the surface of the river. From this point the bridge, which is seventy yards long and composed of rattan cane, stretches to the opposite side of the river, where it is attached to a somewhat small tree supported by a stout post, both of which are again stayed by rattans to trees farther back. This structure was carefully and minutely examined, and revealed

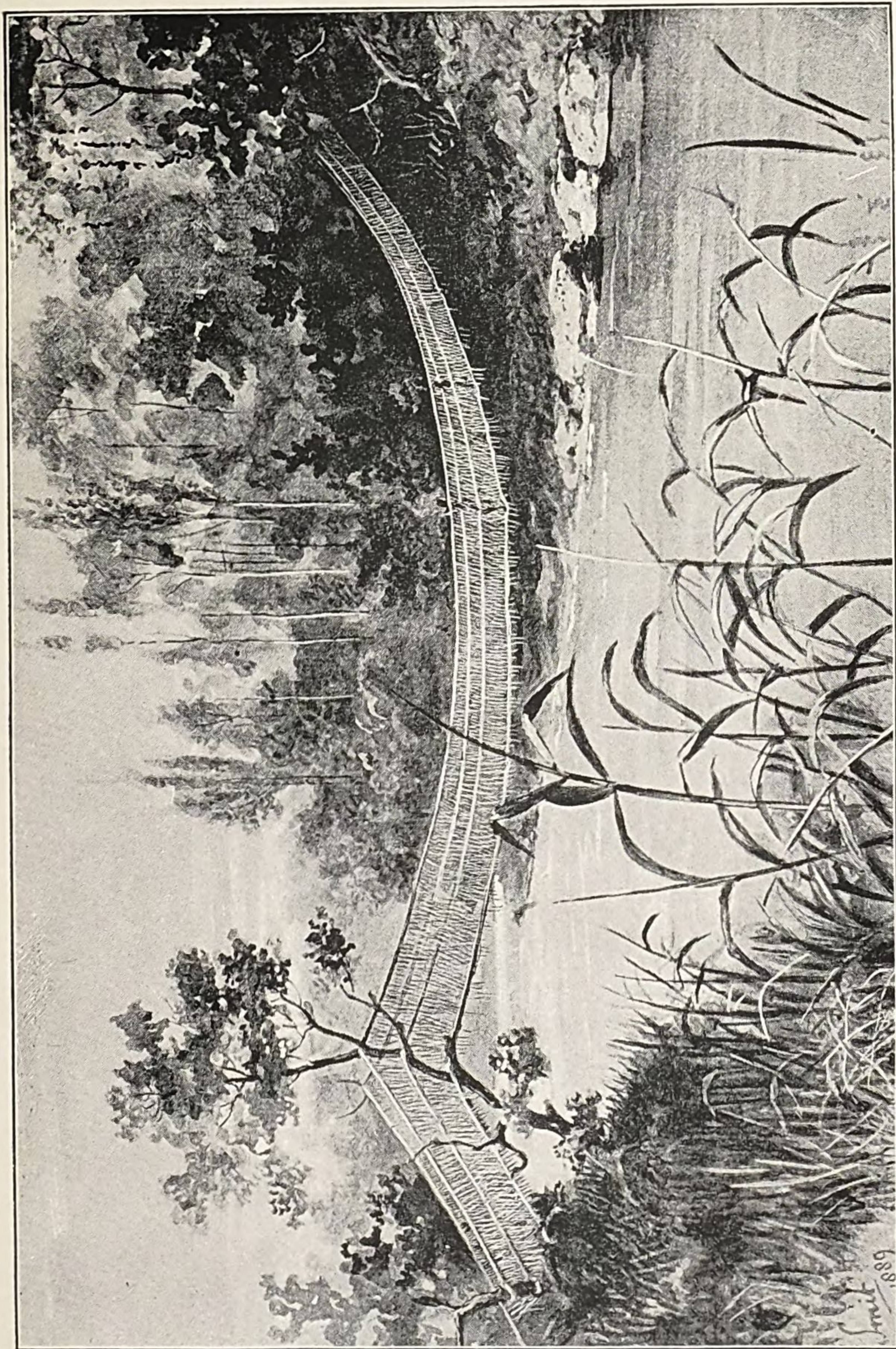


NATIVE SUSPENSION BRIDGE ACROSS THE VANATA RIVER.

The expedition left Fort Mendenhall on April 20, 1889, and proceeded up the Vanappa River, about thirty miles to the westward, where the Vanappa River is joined by one of its openings on the eastern side of the Coast Range system of which had not previously been noticed. From its embouchure to the highest point of this tributary the banks of the river are covered by dense vegetation. The banks are from ten to twelve feet high, composed of deep rich soil, studded with ilimo and other large trees. The ground is covered with numerous snags, the existence of which is indicated by the discoloration of the water by being washed down. The highlands of the interior, and the appearance of the river, the journey was slow and tedious. On the 24th of the month, about the same time was formed forty miles by water from the mouth of the river, in latitude $9^{\circ} 7' S$. This point was reached by a strenuous struggle with the powerful river current, and an expenditure of the best efforts of the boat's crew.

From about thirty miles from its mouth the banks of the river are formed by deep banks of red and blue clayey and slaty formations. The current of the river has cut deep furrows, indicating the passage of water by great winds and deep fissures.

No natives were seen near the banks of the river from its mouth to the depôt by the first section of the expedition, but their traces were indicated by the existence of a carefully constructed suspension bridge across the Vanappa River, at a place where it is narrowed by the encroachment of a rocky escarpment of the hills. Here a large tree of the banyan variety was found, the trunk of which supports an end of the bridge fifty feet above the surface of the river. From this point the bridge, which is seventy yards long and composed of rattan cane, stretches to the opposite side of the river, where it is attached to a somewhat small tree supported by a stout post, both of which are again stayed by rattans to trees farther back. This structure was carefully and minutely examined, and revealed



NATIVE SUSPENSION BRIDGE ACROSS THE VANAPA RIVER.

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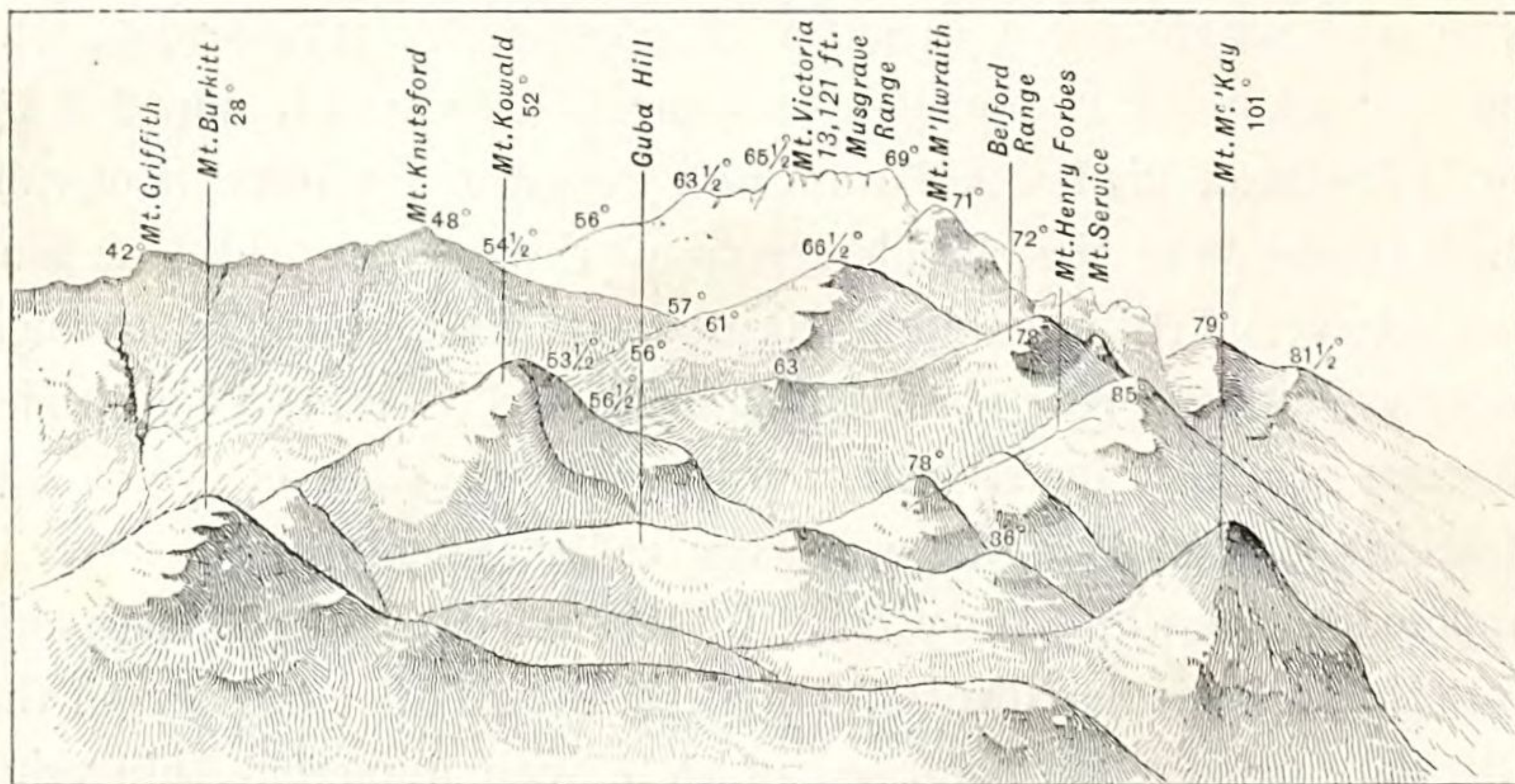
to a very considerable degree the constructive faculties of a primitive race of people.

After the dépôt had been established, some of the party were sent back to Port Moresby for reinforcements, while Sir William in the interim was fully engaged upon a preliminary examination of the neighbourhood, the sketching out of a line of march towards the highlands of the interior, and the procuring of such data as might assist the future movements of the expedition. The course of the Vanapa was also traced for several miles above the camp, and, although assisted by only one man, a track was cut through the scrub and jungle for a distance of seven miles inland along the line of march. His honour's movements were much impeded by the ill-health of his few followers, and the afternoon torrents of rain which spread from the thunderstorms of the interior; the forenoons were sultry, and the vegetation soaking wet in the morning. Although traces were everywhere observed, no natives were seen. This district possesses a dense forest, many of the timber trees of which are valuable. Included in these are the cedar and ilimo; the latter is supposed to be white-ant-proof. Cultivation is rendered impracticable through the narrowness of the gorges and the steepness of the hills, the latter being composed of slate, with numerous thin veins of white quartz; this may be accepted as the general geological condition of the district. In some of the creek beds large isolated boulders of conglomerate and smaller ones of basalt were observed, but no traces of gold or other valuable metals were found.

While exploring the district about two and a half miles from the dépôt, a prominent rock, which was named Jack's Rock, was discovered on Mount Gleeson. This rock, whence a clear unobstructed view of the highlands of the interior, even to the summit of the Owen Stanley range, may be obtained, is situated at an altitude of 1000 feet above sea-level, and its point of vantage is strongly recommended to future observers.

On the 17th May, reinforcements having arrived on the previous

day, the expedition, which then numbered forty-two persons all told, composed of four Europeans, George Belford, a Samoan half-caste, five Polynesians, and thirty-two Papuans, started for the interior. The highest point of the long spur of Mount Gleeson was traversed at an altitude of 1292 feet. Another ridge of about 800 feet high was crossed, and the evening camp made at the confluence of the Exton Creek and the Vanapa River, at an altitude of about 300 feet. From Exton Junction the expedition crossed over two miles of broken country, composed of very steep and precipitous ridges, the altitude



OWEN STANLEY RANGE, AS SEEN FROM JACK'S ROCK.

of which did not, however, exceed 700 or 800 feet; several creeks were also crossed and their beds examined, but, although the formation was slate and quartz, with favourable indications of gold, none was found on washing the gravel.

Taula Creek was reached at an altitude of 583 feet, and the steep western end of Guba Hill ascended and crossed at an altitude of 1000 feet. The geological conditions of this district are quartz and slate, the hills rugged and precipitous, and the timber of no great proportions. Although many of their traces were observed upon the trees along the ridges, no natives were seen at this stage

of the journey. Cæsar Hill was traversed, and the Atoa Creek—a fine clear stream of twenty yards' breadth, with a slaty and basaltic boulder bed—crossed at the 500-feet level. The steep rough spurs and ridges of Mount Kowald were next ascended, its summit crossed at an altitude of 2750 feet, and its northern side descended to the right bank of the Vanapa River, the current of which at this point runs very rapidly over a rough rocky bed. Although straight and in great abundance, the timber trees on Mount Kowald are not of large proportions. The crossing of the Vanapa River, which was accomplished by means of a raft constructed by Mr. Belford, who gallantly swam the muddy seething torrent, was a tedious and difficult task, owing to the partially flooded condition of the river and its irregular and obstructed channel. The expedition continued its journey for a short distance along the left bank of the Vanapa, until impeded by the intrusion on its banks of huge rocky escarpments of mountains, which narrow the river's course, and render the traversing of its bed impracticable; consequently the spurs of Mount Belford were ascended, and the march continued along the crest of its summit at a height of 3500 feet, thence down the precipitous and rough northern side of the mountain to the Joseph River, which, winding along the southern base of Mount Musgrave, at this point passes the 2635-feet level.

The formation of Mount Belford is of the usual slate and quartz, covered with forest of fine timber trees, and, like Mount Kowald, more frequented by birds than any other section of the country through which the expedition passed. From the existence of their paths and camp sites, this mountain region appears to be largely patronised by native hunters, although they neither plant nor reside on it. Tall and graceful wild bananas, a pepper somewhat similar to the *Piper methysticum*, only in this case growing as a tree from twenty to thirty feet high, a very fine rhododendron, and several other rare and valuable botanical specimens with which its slopes are luxuriously clothed, were observed on Mount Belford. The

natural history department was also strongly represented on this mountain by that silent and pestiferous insect, the scrub tick.

Following a native hunting-path up a spur from the Joseph River, the expedition ascended the slopes of Mount Musgrave to the crown of one of its main ridges, at an altitude of 5000 feet. Here was found a large hunting-house, to which was given the name of Goodwin Lodge. This house, which was about twenty-five feet long, ten feet wide, and six feet high, having a roof covered with the leaves of a dwarfish pandanus tree, presented the appearance of recent occupation, but although one of their dogs was observed running about, no natives were seen, nor responses heard to vigorous inviting shouts. The ground around the house was wet and swarming with leeches, and the atmosphere alive with mosquitoes, so that a prolonged halt at Goodwin Lodge was considered undesirable. Following the crest of the ridge in a westerly and northerly direction from Goodwin Lodge, the expedition reached the main crown of Mount Musgrave, at a height of 5588 feet above sea-level, where it camped. Taking advantage of a short halt made here for the purpose of forwarding the rear baggage, the native path was followed to the western end of the crest of the mountain, whence angles were taken to and good views obtained of the Owen Stanley range, and the general conformation of its southern aspect noted. From this point a large native village was seen on one of the ridges at the foot of the south-west spur of Mount Knutsford. The many noises peculiar to native festivity were heard during the first night on the mountain, proceeding from a locality apparently situated some miles to the north-west, and the next day a party of natives honoured the camp by a visit. Friendly relations having without difficulty been established, the expedition was visited by numbers of these mountain people during its stay in the locality, and the relations throughout were of the most friendly character, a circumstance which rendered the operations of the expedition agreeable, and the services of the natives of great value in the supply of food. Their language bears strong relations to the

Papuan dialect, and they are physically stronger than the coast men, perhaps a little shorter, having long, strong bodies, but generally shorter and more muscular legs; they wear neither nose nor ear ornaments, nor do they tattoo. The older men wear caps made of the best cuscus fur, with frontal ornaments made of white shells ground down to thin plates, and sewn together with cheek pieces of black cassowary feathers; others wear caps that are less picturesque, though more elaborate, trimmed with the tusks of boars and the teeth of dogs. Youths generally affect headpieces made of native cloth, apparently manufactured from the bark of the mulberry-tree,



NATIVE MOUNTAINEERS.

into which they gather their thick mops of hair. On the breast they wear a piece of network, with small meshes, about eight to ten inches deep, and long enough to extend rather more than half way round the ribs, where it is fastened behind by strings from its four corners. They all wear the perineal band, as worn at the eastern end of New Guinea, but every man and boy is clothed with an additional girdle of the cloth made from the bark of the mulberry tree, about ten or twelve inches deep, cut up into lappets, over which they also wear in front as an apron a small net bag about from nine to twelve inches in length. On the neck, legs, and arms they wear rings of cane, some of which are plain, others plaited or twisted. Their

features, which are remarkably good, indicate more character and strength than those of the average coast man, and the cheek-bones in many are rather broad and prominent. The nose is generally of the Semitic type, with nostrils either not arched or much more so than is usual in Papuans; the chin and under jaw are also stronger. Although less shy than other tribes, having seen more of white men, they are apparently superstitious and easily frightened. True to their distinctive national characteristics, they possess the usual Papuan fluency. Although no weapons of any kind were seen in their possession, they stated that the bow and spears were both used by them. They grow yams, sweet potatoes, several varieties of bananas, good tobacco, and possess abundance of food, which they readily exchange for salt, beads, and cutlery. Doubtless owing to its possession they do not prize tobacco. Small parcels of peas, beans, and tobacco seeds, which they cultivate, were procured from this interesting tribe of natives, who always made a rule to leave the explorers' camp before nightfall. None of their women were seen. After a day had been spent in camp on the main crown of Mount Musgrave, the expedition continued the ascent of its crest, along which it proceeded for a distance of two miles, and again camped at an altitude of 7180 feet. The temperature here was 70° Fahr. at noon and 60° at night, the climate being raw and foggy. Everything upon the face of the mountain was saturated with moisture and clothed with moss, which lent to the sombre forest a weird and lonely aspect; even at this altitude the mosquitoes were troublesome. Next day the traverse of the crest was continued, when, after ascending to a place 8000 feet above sea-level, and observing no indications of a favourable connecting spur with Mount Victoria, the expedition retraced for a mile to the 7180-foot level, and commenced the difficult and perilous descent of the northern face of Mount Musgrave to the 6000-foot level, where farther progress was then arrested by a precipitous line of rocks crossing the path at right angles.

The dangerous position of the expedition at this stage was



SCOTT'S MOUNTAIN (DISTANT VIEW—SEVEN MILES)

features which are valuable for the more character and strength than that of the Japanese, and the cheek-bones in many are very strong and prominent. The nose is generally of the Swedish type, with a bridge which is either as much more so than is usual in Japanese. The lips and under jaw are also stronger. Although few are tall, some are seen more of white men than are Japanese, and are easily frightened. True to their Oriental nature, however, they possess the usual Japanese courage. Although no weapons of any kind were seen in their possession they show that the bow and spears were both used by them. The great part of the country several varieties of bamboo, and various other plants of food, which they readily exchange for such things as iron. Doubtless owing to the proximity to the coast, various kinds of peas, beans, and wheat were raised. They seldom come from the interior, and it is not until we have reached the coast to leave the country very much improved. Most of their women were seen, and they had been seen at work on the high snow of Mount Mosgrave. The mountains, which are the crest of the range, along which it is necessary to pass, are very high and again camped at an altitude of 10,000 feet. The thermometer here was 70° Fahr. at noon, and it was very cold, with a strong wind and foggy. Everything upon the face of the mountains was covered with moisture and looked very much like a wet rock. The wind was a wild and lonely cry, and the mountains were very much troublesome. Next day the expedition was continued, when, after ascending to a high point, the expedition was met, and observing no indications of a snow-covered mountain, they went Mount Vasson, the expedition having been directed by the Japanese, and encountered the difficult and dangerous nature of the ascent. From Mount Mosgrave to the foot of the mountain, which is the highest point, there is a precipitous line of rocks, crossing the path at right angles.

The dangerous position of the expedition at this stage was



MOUNT VICTORIA (DISTANT VIEW—SEVEN MILES).

rendered more critical by a dense curtain of mist which so completely enveloped it that an observation of surroundings was impossible. Compelled by circumstances, the party camped for the night in this inhospitable and miserable position, subjected to a temperature of 58° Fahr. at night, 60° in the morning, and 67° at noon. Next morning the aspect was so uninviting that the Papuan members of the expedition refused to proceed on the journey. However, after the administration of certain medicine, many real and pretended cases of sickness were cured, and a start having been made, Sir William succeeded, single-handed, in cutting a track right down the rocks and precipices, which was probably the most precipitous and dangerous ever traversed by carriers; even the natives at first refused to risk the descent, but, after being assured of the safety of their leader, they eventually hazarded the dangers of the path, and, by great perseverance and unflagging exertions, the expedition descended to the edge of a small creek, at an altitude of 4300 feet above sea-level, weary and greatly discouraged by small progress and inhospitable surroundings. At the 3380-feet level on Mount Musgrave, a small precipitation occurred at night, and the whole zone was enveloped in fog; at an altitude of 5588 feet a little rain also fell towards the evening, and the fog envelope commenced to close before noon. The trees of this zone are not of large size, and most of them appeared to belong to the myrtaceous family; there is plenty of fine timber growing below the 6000-feet level, but above that altitude the trees are smaller, and generally very crooked. The summit of the mountain, which was found to be 9150 feet high, is narrow in places, but not so rocky as a distant view of its general appearance indicated. The geological composition of the whole mountain, from base to summit, is slate and quartz, with well-marked white veins of the latter between the 6000 and 7000-feet levels. Owing to the unsatisfactory physical condition of several of the members of the expedition, Sir William was obliged to continue the journey from last camp, at the 4300-feet level on the north

G



side of Mount Musgrave, with only Mr. Belford, two Polynesians, and six Papuans; Mr. Cameron, his honour's acting private secretary, with the remainder of the party, at his own wish returned to the camp on Mount Musgrave, and there awaited Sir William's return.

Continuing the descent across a succession of precipitous cliffs and rugged gorges, bristling with dangers, the expedition succeeded in reaching the base of the steep rocks at the foot of Mount Musgrave, also the Vanapa River at the base of Mount Knutsford, about noon of the same day. The Vanapa at this place runs west by south, and is not more than half the size of its section at the west end of Mount Belford. As crossing its channel, which was thirty to forty yards wide, was altogether impracticable for men carrying packs, and dangerous under whatever circumstances owing to its obstruction by huge irregular boulder piles, and seeing no easier accessible route over the comparatively short gap of three miles which separated them from Mount Victoria, it was decided to ascend Mount Knutsford, and follow the steep spur connecting it with the Owen Stanley range. Accordingly, the dangerous and difficult task of crossing the Vanapa River was undertaken, and accomplished by means of a temporary bridge constructed by Belford, at a place where an accident or fall from it into the river would have resulted in certain death. The altitude of the river at this crossing was 2790 feet above sea-level, and the temperature at midday 68° Fahr. From the left bank of the river they commenced the ascent of one of the leading spurs of Mount Knutsford, which was rugged and precipitous, and camped at two native houses apparently used as a halting-place, at an altitude of 500 feet above the river crossing. At this point no rain fell, but there was a partial obscuration by fog from early in the afternoon. Next morning the ascent of the mountain was continued, and after traversing an estimated distance of two miles the evening camp was made at the 6500-feet level, where the temperature at 3 P.M. was

72°, and at 6 P.M. 67° Fahr. This region was completely enveloped in fog by the middle of the afternoon, but no precipitation occurred. Here, as on the higher zone of Mount Musgrave, the trees were generally not large, and the forest maintained a similar myrtaceous character. Excepting a few mountain pigeons, which were hard to obtain, no game was seen. The ascent was commenced early next morning, and a distance of one mile traversed by noon, when the temperature was 64° Fahr., and the whole region completely enveloped by a column of dense fog.

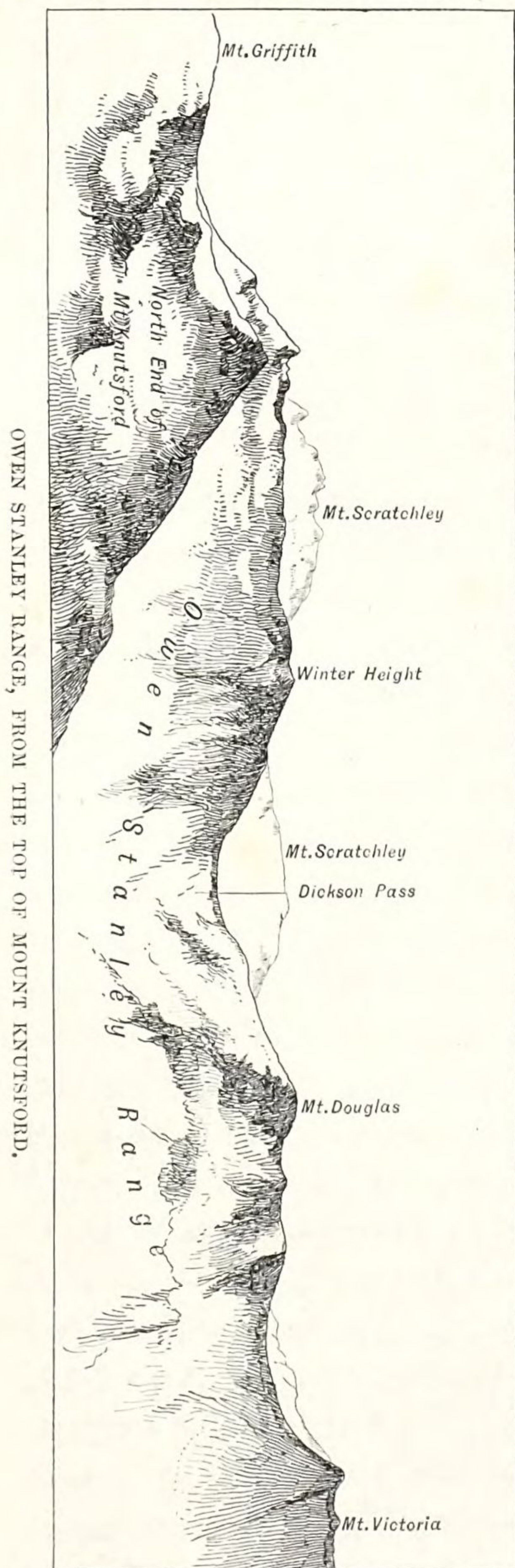
After a most laborious and difficult ascent of the almost perpendicular face of a precipitous and rugged spur, which, but for the existence of the friendly roots, trunks, and branches of moss-draped trees, would have been inaccessible to packers, a camp was made in the afternoon on a razor-backed ridge barely wide enough for a path, at an altitude of 8300 feet, where the last shower of rain met with on the upward journey fell; excepting the small quantity caught from this shower no water could be obtained at this camp. This region was remarkable for its depressive, death-like stillness, which was intensified by the grim, sepulchral appearance of the trees, with their roots, trunks, branches, and slightly even their leaves, enshrouded in thick clinging garments of moss, which rendered them dismal to the eye and repulsive to the touch. The surface of the ground and the vegetation were soaking wet, and the dense curtain of mist, especially when its wavy motion caused it to ascend from the abysmal ravines, or break on the rugged spurs, caused the surroundings to appear more gloomy and awe-inspiring, and the rugged and precipitous spurs and ridges even more terrible and inaccessible than their real condition indicated. At this camp, the number of the party was further reduced by one Polynesian and three Papuans, who were sent back to the camp on Mount Musgrave. Twenty pounds of rice was hidden in a secure place at this camp, and the party, now consisting of his honour, Sir William MacGregor, G. Belford, Joe Fiji, and three Papuans, provisioned with fifty pounds of

rice, thirty pounds of flour, about six pounds of ham, about the same quantity of salt beef, and armed with two shot-guns and one revolver, continued the journey on the morning of the 4th June, without breakfast. After proceeding three-quarters of a mile up the face of Mount Knutsford, they camped at a native hunting depôt, which had three cooking places excavated in the ground about eighteen inches wide, nearly the same depth, and half filled with small stones. The altitude of this camp was 8815 feet, and the temperature at noon in the shade 63° Fahr. As the forest trees were larger and straighter, and there was less moss than in the region between 6000 and 8000 feet, also as it was found that the upper margin of the dense afternoon fog that had settled down on the region immediately below reached no higher, it was considered that this camp marked the upper line of the dismal, wet, vaporous, mossy zone.

The next day, at an altitude of 9000 feet, the expedition entered an undergrowth of bamboos, with stems about an inch in diameter, and easy to cut; this continued until the 9500-feet level was reached, when the character of the bamboo changed entirely; here the stems grew as close together as wheat, and their tops ran completely over and entirely obscured the heads of the tallest trees, so that the task of cutting a track through them was both tedious and laborious; nor was this condition of bamboo forest changed till the expedition left Mount Knutsford, beyond which there was none. The zones of moss and mist, which are apparently inseparable, end together, and a fine dry climate begins with the bamboo, which is never lost till a descent is made to the 8000 and 8500-feet level into fog and moss. At 2 P.M. on the 6th June the summit of Mount Knutsford was reached, and its height found to be 11,100 feet above sea-level. The climate here was magnificent, a dry and cold atmosphere, possessing a temperature of between 60° and 70° Fahr. during the middle of the day in the partial shade of the forest, and 40° to 45° Fahr. at night and in the early morning. This position was some 2000 or 3000 feet clear above the great masses of snow-white clouds,

which completely cut off all view of the lower regions. The top of this mountain culminates in two great accessible masses of rock, each about 100 feet high, separated by a space of about a quarter of a mile, upon the middle of which is situated a smaller and lower mass of rock. The limited area of these rocky peaks was covered with an alpine flora, which also flourishes in the highest 500-feet zone of the mountain; specimens of all these were obtained, but altogether the limited flora of Mount Knutsford was considered disappointing. From base to summit the geological components of this mountain are diorite and crystalline micaceous schist.

The clouds in this region, which were apparently motionless, excepting an occasional projection of small jets of vapour shot upwards through narrow ravines right to the summit of the mountains, were considered to be formed solely by the union of local causes, and not brought thither by the south-east winds. The upper surface of this stratum of cloud, which was usually about 4000 to 5000 feet thick, was like a field of snow, almost dazzling in whiteness, with rugged masses, which, being irregular undulations, extended hoary flakes so far as to obstruct the vision beyond the limited horizon, while the tops of the higher mountains reared their lofty and majestic heads from 2000 to 5000 feet above this Arctic landscape, which caused them to assume the appearance of islands in a silvery sea of glassy smoothness. In the early forenoon, before the obscuration of the lower regions occurred, which was usually about ten o'clock, a clear view could be obtained of the country bounded between the top of Mount Knutsford and the south coast; it was also observed that numerous plantations and plantation houses were located on the north side of Mount Musgrave, and that the only permanent villages and human habitations on any section of the Owen Stanley range were situated on Mounts Knutsford and Griffith. The altitude of the sites of the permanent villages did not exceed from 4000 to 5000 feet above the level of the sea. From the top of Mount Knutsford the most extensive and effective view was obtained



OWEN STANLEY RANGE, FROM THE TOP OF MOUNT KNUTSFORD.

of the basin and course of the River Vanapa, as it meandered gracefully over the wild romantic landscape to join the sea-shore, where the whole of the southern waters of the Owen Stanley range mingled with those of the ocean.

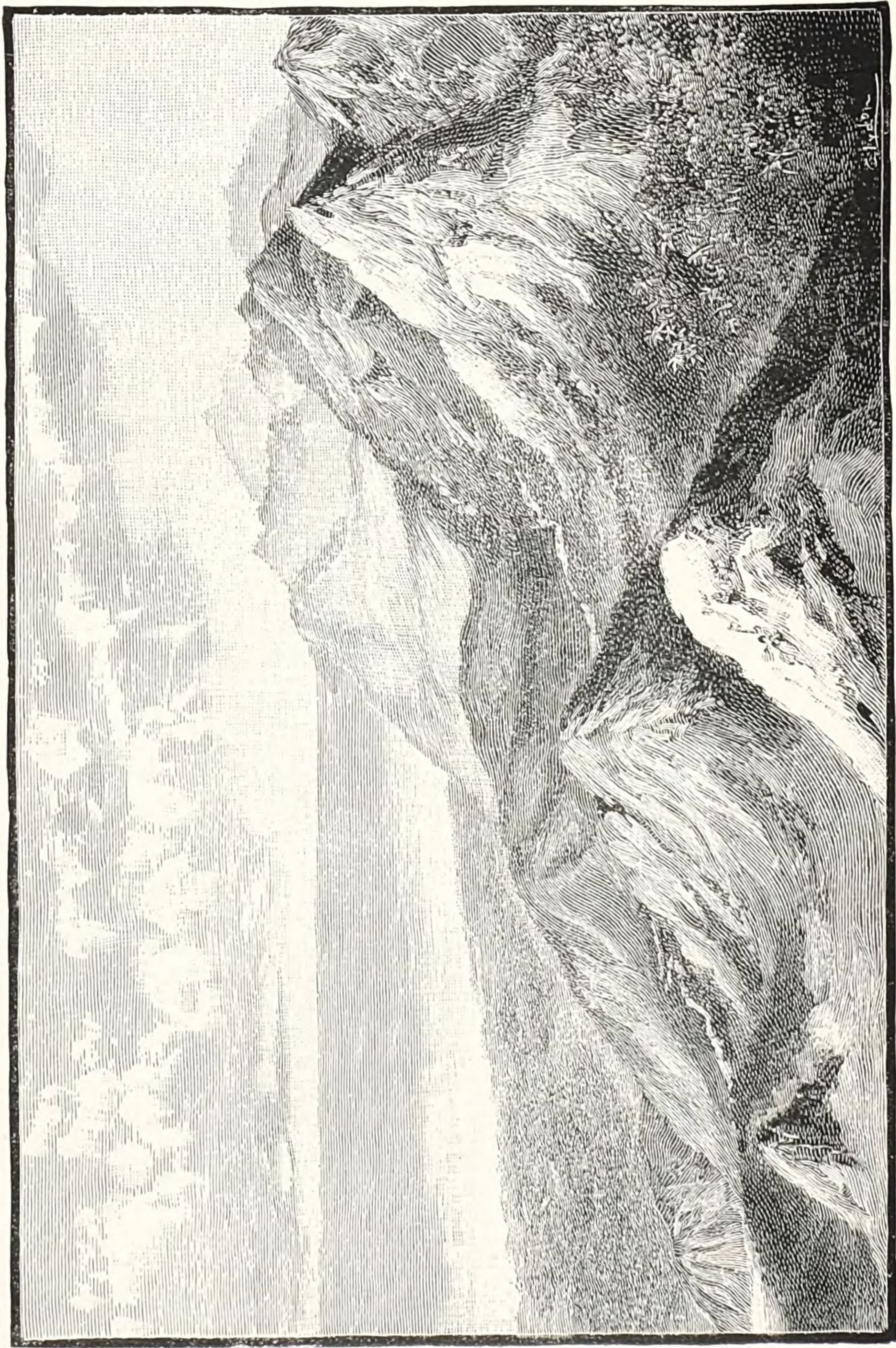
“So wondrous wild, the whole might seem

The scenery of a fairy dream.”

This river divides at the north-west end of Mount Musgrave into two branches; the one trending west drains the eastern waters of Mount Cameron, the eastern and southern waters of Mount Lilley, and the southern waters of Mounts Thynne and Griffith. The eastern branch gravitates at first between Mounts Knutsford and Musgrave, thence for a short distance separating the former from Mount McIlwraith till they are divided by a projecting offshoot of Mount Victoria; the river then forms itself into five divisions. The first branch flows between Mounts McIlwraith and Morehead; the second between the latter and Mount Victoria; the third between the latter and the southern slopes of Mount Douglas;

the fourth between the latter and Winter Height; and the fifth, which is the principal and true head of the Vanapa River, flows between Mounts Griffith and Knutsford on the south, and that part of the Owen Stanley range named Winter Height on the north. The lower and middle section of this river are well adapted for the transportation of timber; but, owing to the immense boulders and stones which obstruct its channel, the upper section from the west end of Mount Musgrave is impracticable for navigation. Mounts Service, Morehead, and McIlwraith attain to altitudes of from 10,000 to 11,000 feet, and are situated between Mount Victoria and the Brown River, which is a branch of the Laroki. On the 8th June the journey was continued in a north-westerly direction, along the summit of Mount Knutsford; and, for the last time on the outward journey, across the Vanapa, at a place 10,130 feet above sea-level, where the river is five yards wide, with a very rocky channel. On crossing the river, the ascent of the central spur of the Owen Stanley range was commenced, and on the afternoon of the 9th Winter Height was reached, at an altitude of 11,882 feet, on the top of the great central ridge of the Owen Stanley range; continuing the march on the same day, a camp was made on the lowest part of this ridge, between Mount Douglas and Winter Height, where the top of the gorge on the south watershed meets a similar formation on the north watershed, at an altitude of 10,884 feet above the sea. The forest here was mainly composed of cypress, and the only sound to break its silence was the howling of wild dogs. Next day the march was continued, the top of Mount Douglas passed over, at a height of 11,796 feet, where strawberries were found, excellent in flavour, but not of large size; and, after travelling a distance of five or six miles, camp was pitched at a point on the main Owen Stanley range, some few hours' march from its highest crest, which was reached at 11 A.M. on June 11. This culminating crown, which was named Mount Victoria in honour of Her Majesty the Queen, possesses no trees within 1500 feet of its top, and but few bushes within 1000

feet of it; it, however, possesses a great variety of grasses, daisies, buttercups, forget-me-nots, heaths, &c. Of the birds, which were very few and uninteresting, three specimens were obtained, including a lark. Two nights were spent at a point on Mount Victoria, 12,452 feet above the sea, and 670 feet below the summit of its highest peaks. The temperature here was, during the day from 10 A.M. till 4 P.M., between 50° and 60° Fahr. in the shade; and on the tops of the highest peaks, where exposed to the direct solar beams, the temperature in the middle of the day was 70° Fahr.; and in the early mornings, before being reached by the rays of the sun, the surface of the ground was white with frost, and icicles more than an inch in diameter, and seven or eight inches long, were brought into camp. Excepting a slight haze at times, when a strong south-east wind was blowing, the sky in the daytime was blue and cloudless, and at night the stars shone with great brilliancy in the clear heavenly vault. The existing conditions of Mount Victoria and of all the most prominent features of the Owen Stanley range indicated a dry region, and the impressive silence of the surroundings was not broken by even the trickling of rivulets nor the moaning sounds of waterfall and cataract. A series of six separate serratures or peaks project from a common base, the plane of which is one and a quarter miles long. It extends from south-east to north-west with a slight curvature, the convexity of which lies to the north of a straight line joining the extremities, constituting the crest of Mount Victoria. The extreme north-west and the south-east of these peaks, which are of equal height and comparatively easy of ascent by great rifts in their rocky sides, are a few feet higher than those of intermediate position, which, being formed of nearly perpendicular and overhanging, bare, rough-surfaced rocky masses, especially the upper hundred feet of their sections, are exceedingly difficult of ascent. These peaks are separated from one another by chasms many feet deep, laborious to traverse, and their tops, which are composed of decomposed rocks, bedecked with beautiful moss and



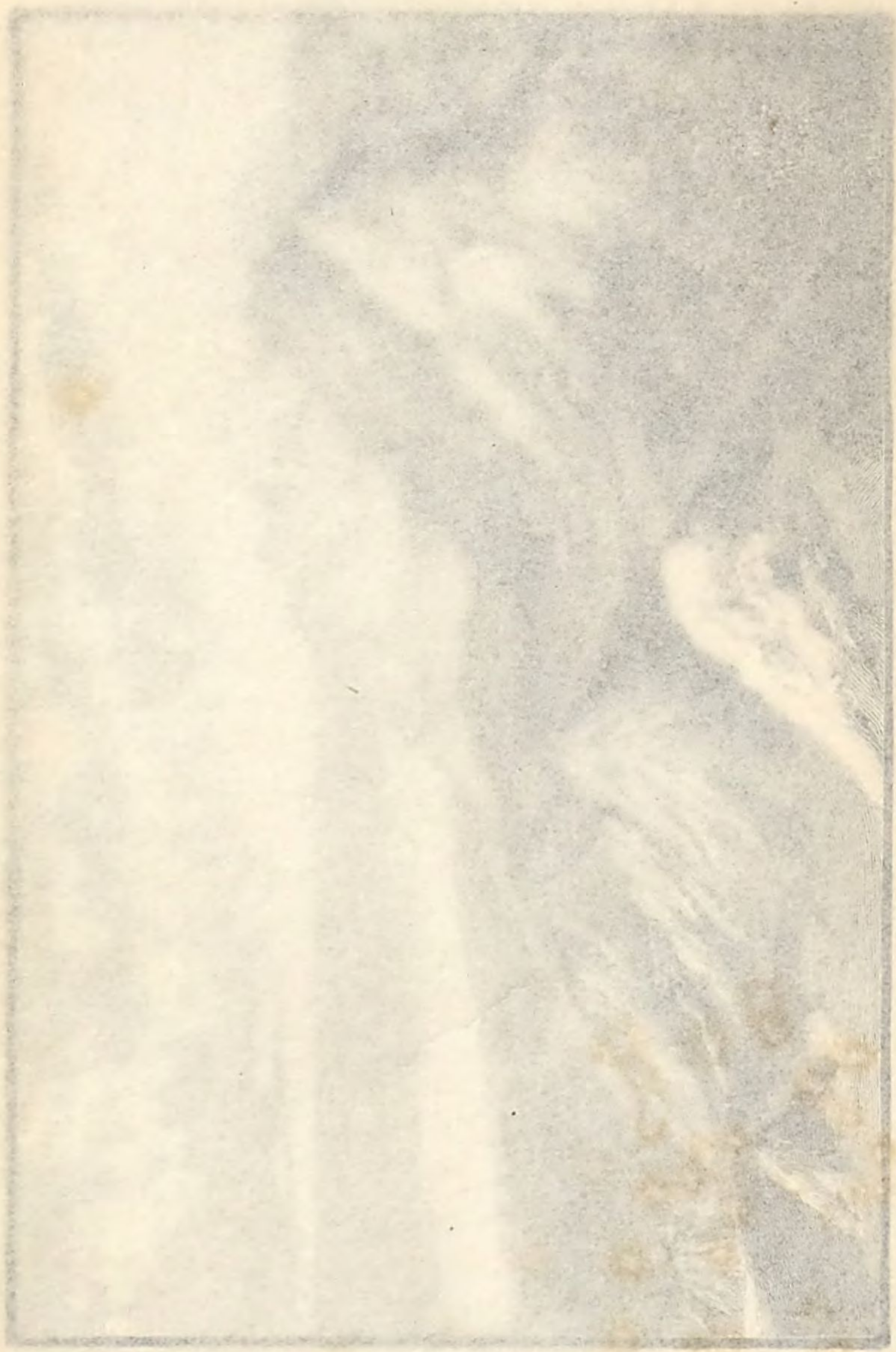
BIRD'S-EYE VIEW FROM PEAK NO. 3, MOUNT VICTORIA, LOOKING E.N.E.

the mountain, being eight to ten miles broad, and from fifty to sixty miles long. The Owen Stanley range is not the culmination of a great granitic block, as described by previous writers, but it does possess a crowning eminence, which is not in ordinary geographical or geometrical form, but is a pyramidal block or pinnacle, although it appears in the form of a mountain crest composed of



MOUNT VICTORIA, LOOKING ALONG MOUNT VICTORIA FROM THE SOUTH-EAST PEAK.

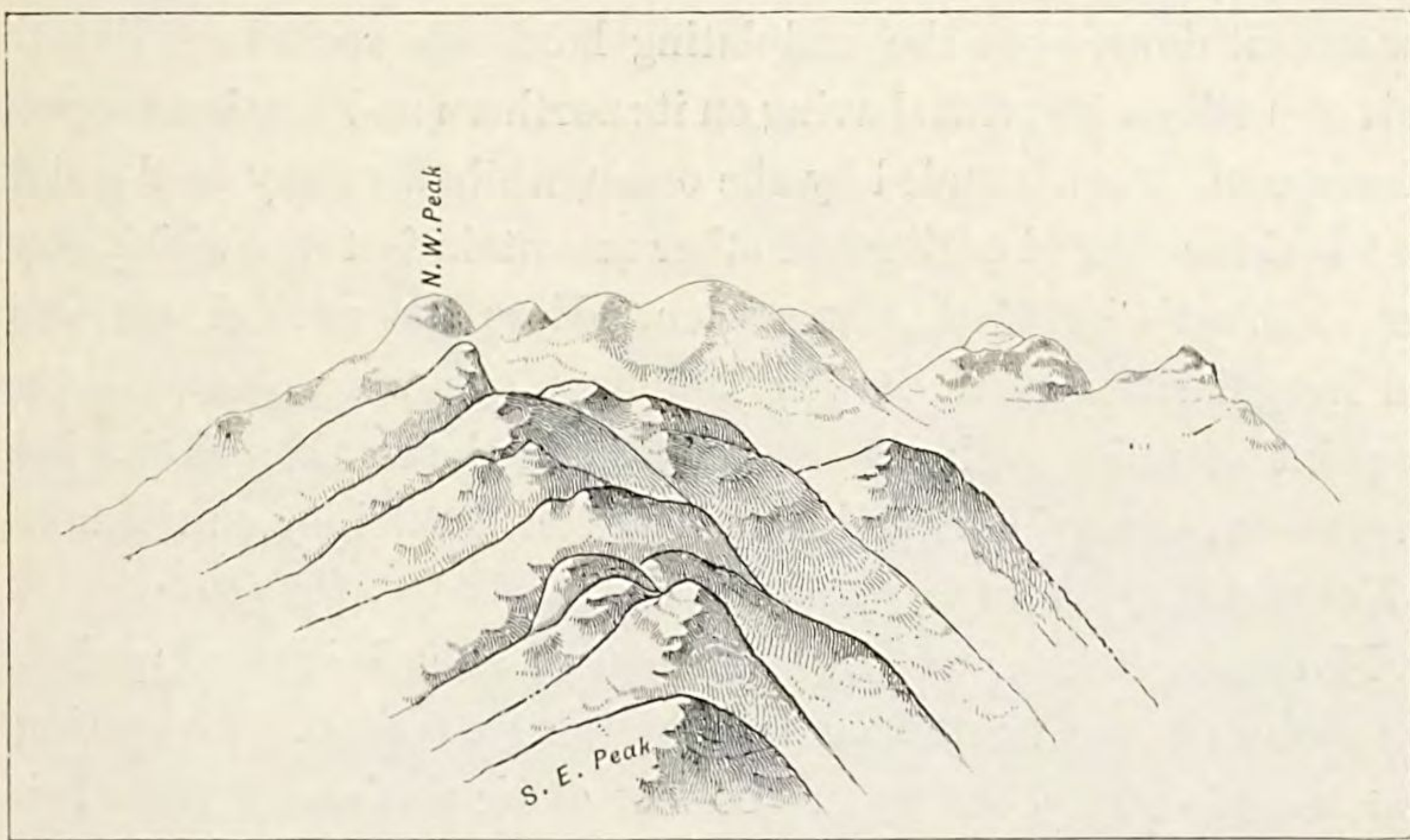
they make it appear one solid mass when viewed from the sea. Mount Victoria is formed by the convergence and union of five precipitous buttresses exceeding 12,000 feet in height, three on the northern side, two on the southern side, and one on the south-east side, all of them bristling with inaccessible crags, and precipices. The Owen Stanley range is unbroken from Mount Lilley in the north-west for thirty miles to Mount Victoria in the south-east.



BIRD'S-EYE VIEW FROM PEAK NO. 3, MOUNT VICTORIA, LOOKING N.E.

flowering heath, are from eight to ten yards broad, and from fifty to sixty yards long.

The eastern end of the Owen Stanley range is not the culminating axis of an isolated pyramidal block, as described by previous observers from afar, nor yet does it possess a crowning eminence, the conformation of which in ordinary geographical or geometrical phraseology could be named a pyramidal block or pinnacle, although it is just possible that the form of a mountain crest composed of



PEAKS OF MOUNT VICTORIA, LOOKING ALONG MOUNT VICTORIA FROM THE SOUTH-EAST PEAK.

many peaks may make it appear one solid mass when viewed from certain positions.

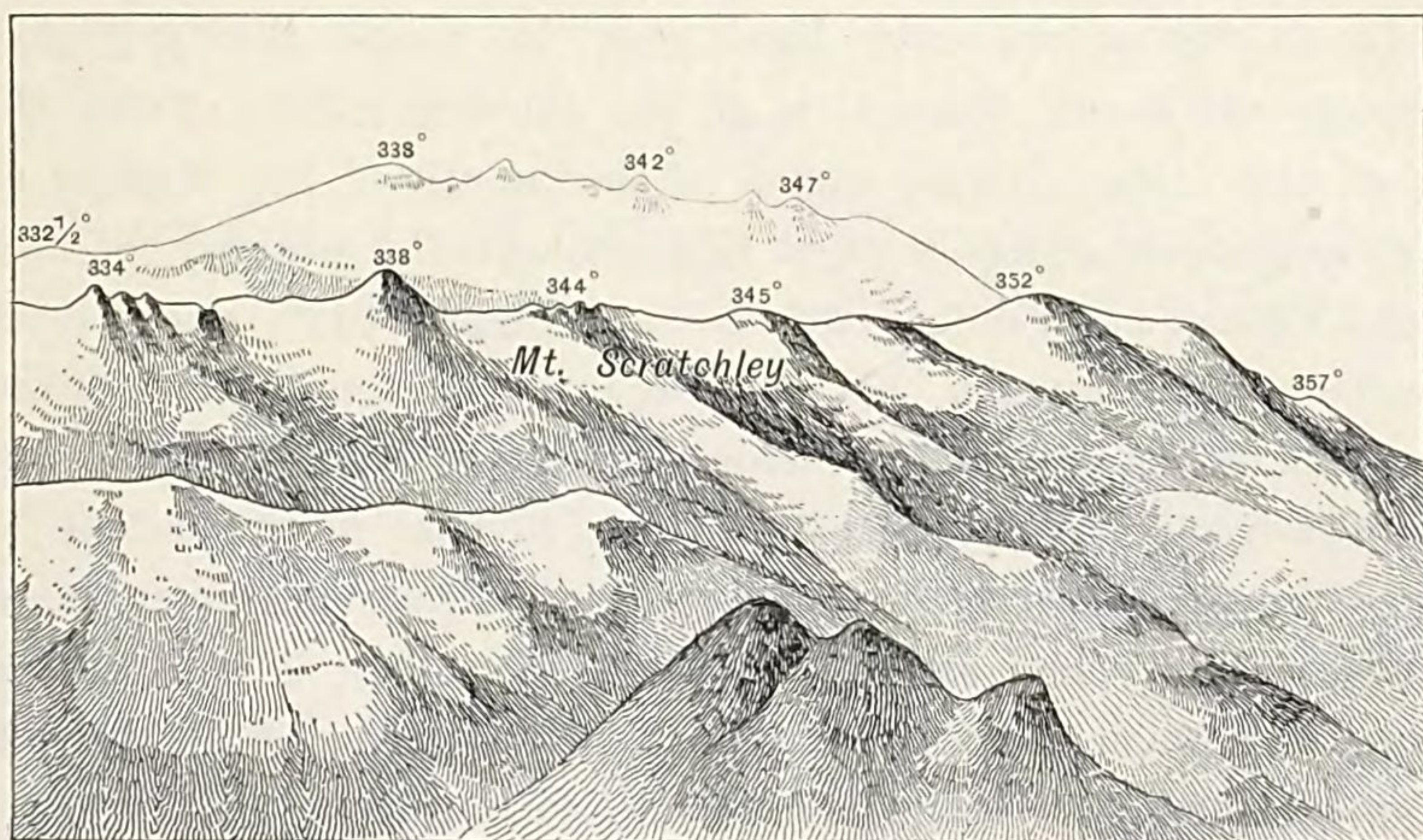
Mount Victoria is formed by the convergence and union of five huge rocky precipitous buttresses exceeding 12,000 feet in height, two of which are on the northern side, two on the southern side, and a giant one on the south-east side, all of them bristling with grim peaks, inaccessible crags, and precipices. The Owen Stanley range continues unbroken from Mount Lilley in the north-west for a distance of about thirty miles to Mount Victoria in the south-east,

which is separated by a number of low rounded hills from the rugged mountainous country to the north-west of and near Mount Obree; it will therefore be observed that to speak of Mount Obree as part of the Owen Stanley range is just as incorrect and misleading as it is to speak of the pyramidal block or highest pinnacle of Mount Owen Stanley.

From the lofty peaks of Mount Victoria the panoramic views were wild and romantic, as, standing upon the rocky precipitous cap of the mountain, the eyes of a Briton for the first time gazed in amazement down upon the undulating landscape spread out like the folds of a silken garment, having on its northern and southern aspects the scope of vision bounded by the ocean, while far away to the right stretched the rugged outlines of other mountain features which mark the eastern limits of the Possession. Here the natural curvature and irregularities of the Owen Stanley range were observed from its point of union with Mount Griffith on the south, and the bold, bare, rocky, treeless, serrated-topped Mount Scratchley on the north, to Mount Lilley on its extreme north-westerly termination. .

Mount Scratchley, which was estimated at a height of probably 12,250 feet, is the third mountain in the Possession. Presenting a bold rugged outline, the upper 500 feet of its sectional surface being composed of bare rocky masses, it trends in a north-easterly direction for a distance of probably three or four miles, where, being formed into two great offshoots, it terminates opposite Mounts Gillies and Parkes. North from Mount Scratchley, and trending in a similar direction, lies Mount Albert Edward, the second mountain in the Possession. This mountain, the height of which is estimated at 12,550 feet, possesses a partly bare and partly grass-covered rocky summit, with the upper 1000 feet of its section destitute of timber, but only four or five miles of its crown was visible from Mount Victoria. Between Mount Victoria and the northern coast, which was plainly visible for several hours in the forenoon, only two great mountain masses were observed within the first quadrant of the circle.

These mighty mountains, which are apparently separated from one another and from the Owen Stanley range, were named Mounts Gillies and Parkes. They are from 7000 to 8000 feet in height, and the most western, Mount Gillies, presents a regularly shaped profile of from fifteen to twenty miles long in a north-easterly direction, densely covered with an unbroken forest mantle, and separated from Mounts Scratchley and Albert Edward by a valley of a mile or two in width, and from Mount Parkes, east of it, by a river. Mount



MOUNT ALBERT EDWARD, FROM PEAK NO. 3 MOUNT VICTORIA.

Parkes, which attains a length of from twenty-five to thirty miles, assumes a longitudinal position, similar to the direction of the Owen Stanley range; in general physical appearance it resembles Mount Gillies, has no sharp, well-defined peaks, and is covered with forest. Between Mount Parkes on the north, and the ends of Mounts Scratchley and Douglas on the south, a valley two or three miles long widens out and disconnects the former from the end of the Mount Obree range. This valley, which maintains an average breadth of four or five miles and a length of thirty miles, appeared to be thickly populated.

Although it was impossible to indicate the direction in which they ran, rivers were nevertheless seen between the end of the Mount Obree range and Mount Parkes, and between the latter and Mount Gillies, while far away easterly and southerly the great physical features of that part of the Possession were descried.

Viewed from the lofty summit of Mount Victoria, the general conformation of the territory on the northern side of the range appeared uniform and comparatively flat, and the population greater than on the southern slope.

In so far as we have been able to prove, the geological structure of Mount Victoria is of the simplest kind. From the top of the Owen Stanley range to the mouth of the Vanapa no great varieties of order occur, so that geologically speaking the floor of the Vanapa basin differs little from its highest to its lowest level. Specimen rocks brought back indicated the existence of crystalline micaceous schist on Mount Victoria, diorite on Mounts Griffith and Knutsford, and the occurrence of traces of gold in the bed of the upper Vanapa, while in its other sections micaceous schists, hornblende, porphyry, and altered sandstone exist; but, as it is not yet known how much of these rocks are representatives of the districts in which they were found, no definite conclusion as to the actual geological conditions of that part of the country can be formed. Yellow sands containing gold also occurred in the lower section of the Vanapa basin.

From the top of Mount Victoria peaks angular measurements were obtained and recorded of the prominent features of the landscape. On the top of the north-east peak Mr. Belford left a powder flask containing a record of Sir William MacGregor's ascent of the mountain on June 11th, 1889, and stating that he had given to it the name of Mount Victoria. On the top of the south-east peak Sir William drove the stick he had used for resting the compass on when observing, and on the morning of the 13th June the expedition commenced the return journey, almost following their outward track.

The fragments of the expedition were collected, and the coast reached in twelve days.

Although great care was exercised, the expedition was unable to identify places on the Owen Stanley range named and described by Mr. Forbes. We are reluctantly constrained to omit these names, which, if judiciously and appropriately applied to well-defined places, would have received full recognition. It is also regrettable that, in describing other localities to which he assigns positions, that explorer has omitted to supply the data employed in their determination.

FLORA.

Regarding the flora of the Owen Stanley range, Baron Sir F. von Mueller, in a communication addressed to Sir William MacGregor, says:—

“The ascent of the mountains of the Owen Stanley range in New Guinea to their very summits, recently accomplished with so much courage and perseverance by Sir William MacGregor, demonstrates the occurrence of an almost alpine vegetation between elevations of 11,000 feet and 13,000 feet; and more than this, it renders known for the first time an extraordinary and significant commigration of forms, some typical of the northern, others of the southern hemisphere. On the crest of the range, above the limits of forests, occur, as we now learn, so near to the equator, such mainly extratropic genera as *Ranunculus*, *Hypericum*, *Arenaria*, *Potentilla*, *Rubus*, *Epilobium*, *Aster*, *Erigeron*, *Helichrysum*, *Senecio*, *Gentiana*, *Veronica*, *Euphrasia*, *Trigonotis*, *Scirpus*, *Schœnus*, *Carex*, *Agrostis*, *Aira*, *Poa*, and *Festuca*. Many of these approach in their affinity to forms familiar to us in Europe, a few even being identical with British species, and appear thus to reach in New Guinea their most southern geographic limits. But, on the other hand, many of these Papuan highland plants are of far southern type, such as *Drimys*, *Drapetes*, *Donatia*, *Styphelia*, *Phyllocladus*, *Libertia*, *Carpha*, *Oreobolus*, *Gahnia*,

Dawsonia; indeed, some of the species are absolutely the same as congeners of the Australian and New Zealand Alps. In the collections which, during this first attempt of Papuan highlands exploration, could not be rendered very large in specific forms, Ericaceæ (within the genera *Rhododendron*, *Agapetes*, and *Vaccinium*) are rather prominent. Another remarkable fact now established is the identity of several plants of the Owen Stanley ranges with such as were described by Sir Joseph Hooker from Kina-Balu in Northern Borneo, where they were discovered by Sir Hugh Low at elevations of about 8000 feet; for instance, *Drapetes ericoides* and *Drimys piperita*. The four conifers gathered during Sir William MacGregor's expedition consist of *Araucaria Cunninghami*, a *Podocarpus*, a *Phyllocladus*, and what may possibly be a *Libocedrus*; of the latter, however, no fruit was obtained. So far as the material before us allows us to judge, the endemism in the alpine vegetation of New Guinea seems far less extensive than might have been supposed. The writer of these lines pointed out some years ago, against the views of a distinguished Italian naturalist, that although the main expressions of the Papuan flora in the lowlands and midlands might be regarded as prominently Malayan (notwithstanding the occurrence of *Eucalypts* and *Phyllo-dinous acacias*), yet we could not ascribe the same general characteristics to the highland vegetation, when *Araucaria* had already come within reach. That the Papuan alpine flora contains so many largely Australian elements, as we are now able to show, must lead to various scientific generalisations far beyond those of phytology."

Regarding the names applied to the most prominent features of the Owen Stanley range, it may be here stated that, as an entire unacquaintance with their orthography through limited and imperfect intercourse with the native inhabitants of these interior highland zones precluded an application of their more euphonious and appropriate appellations, a general European nomenclature was of necessity adopted. This was wholly based upon the broadest national sentiment, as being compatible with the

principles of the historical section of geographical sciences, and in accord with the original principle which prompted the bestowal of an English name on the range by the officers of H.M.S. *Rattlesnake*. While retaining the original name for the whole range, carefully selected names of European origin have been bestowed upon such components of the whole as appeared to possess a sufficiently marked character by which future identification could with ease be possible. To assure the permanent realisation of this, and to guard against probable future ambiguity, the highest crest bears the illustrious name of our beloved sovereign, under whose rule we are united in lasting bonds of peace, to breathe the exhilarating air of freedom, and to enjoy the pleasures of prosperity. The other secondary features are known by the names of such of our great statesmen and others who have distinguished themselves in the advancement of British interests in New Guinea, either in advocating its foundation as a British possession, or by aiding in its subsequent development.

The results obtained by the uplifting of the shroud in which the alpine regions of British Papua had for ages been enveloped, by Sir William MacGregor, have added largely to various departments of geographical science, especially as applying to its topographical and cartographical aspects.

After the author had concluded the reading of his paper at the evening meeting of the Royal Geographical Society of Australasia already referred to at the commencement of this chapter, Sir William MacGregor, in addressing the meeting, said that perhaps it might sound something like a paradox to say that after listening to the very able paper which had just been read, he had learned nothing from it. What he meant was that Mr. Thomson had exercised so much care in preparing his paper, that he (the writer) had practically made no mistakes. Now that said a great deal. That afternoon two friends of his had each sent him a copy of a work on New Guinea. One friend sent him Mr. Lawson's book, and another Mr. Romilly's. He simply mentioned the books together—not because they had any

relation to one another, but on account of the coincidence of their coming to him at the same time. He did not mean to infer that they were alike in character. He had not yet looked into Mr. Lawson's book, but he had looked into Mr. Romilly's, and though he had only a few moments to spare over it, he learnt a great deal—a great deal that he did not know before. The first thing he learnt was that one could not get up the Owen Stanley range, and that if one did it would be no use, because nothing could be seen from it. That was new to him, for he could see a great deal from that range. The second thing he learnt was that it was the abode of the devil. (Laughter.) From what he had heard and read of that person's character, he would say that that range would be the very last place to find him, for there was practically nothing for him to do there. Turning over a few more pages of Mr. Romilly's book, he learnt next things about the character of the Papuan which he did not know before. Mr. Romilly said, for example, that he had never heard of a brave man, or of a brave deed being performed, amongst the Papuans. He (Sir William MacGregor) could tell them this, that if they were in New Guinea now, and he were asked who was the bravest man there, he would say Ginger, and Ginger was a Papuan. He was certainly one of the bravest men he (Sir William MacGregor) had ever come across, but he was not much more than half the size of Mr. Romilly or himself (Sir William MacGregor). Mr. Romilly also told us that he had been looking for a virtue among the Papuans, and had been unable to find one, even that of conjugal virtue among married women. Well, he (Sir William MacGregor) had not been in New Guinea so long as Mr. Romilly, but he had discovered virtues of different kinds in the Papuan race. He had never in the whole of his experience heard of a criminal assault upon a woman among them, and in that respect the Papuans must stand head and shoulders above all other communities. This had been brought specially under his consideration when having to deal with matters more or less under a legal aspect. But there was another virtue which was very

pronounced amongst them. The Papuans, in their domestic and family relations, were, he would say, about the most affectionate people on the face of the earth. They were affectionate in the tribe, in the village, and even in the district to which they belonged. He had seen when a man was arrested in a very large village the whole of the population—men, women, and children—turn out to cry and lament because a prisoner was being taken away. This was a scene which very greatly impressed him at the time. Unfortunately, he had had cause to see similar scenes since, but he was convinced that, so far as family ties were concerned, the Papuans had a virtue which he believed capable of considerable development. He could go further, and say that no man, tribe, nor community in which the family tie and the domestic tie had developed was without hope of improvement. He had no doubt that a great deal could be done with any people possessing such domestic and family attachments. He had, however, no idea of entering upon a speech on this occasion; he preferred very much to hear other people speak. He feared that he had gone on to a matter which had got a little away from bare geographical details. His friend Mr. Thomson not long ago wrote a paper in which he tried to put the study of geography in a true light—not as the mere study of the height of mountains or the length of rivers, but as the whole history and aspect of a country, its geology, fauna, and flora. Looking at his digression in that light, they would perhaps pardon his somewhat irrelevant remarks. He wished to express his sincere thanks to Mr. Thomson for the careful and able way in which he had placed the facts contained in his paper before them.

CHAPTER VIII.

THE LOWER FLY RIVER.

“As it flows on towards the sea it loses its force and its motion, and at last, as it were, becomes lost and mingled with the mighty abyss of waters.”—SIR H. DAVY.

OF the territorial area bounded between the Aird River on the east and the River Fly on its western aspect we know comparatively little. It is an unexplored region, and for that reason its various geographical conditions are, at this period of our Papuan childhood, enshrouded in obscurity, through which the piercing rays of light generated by the motive power of civilisation have not yet penetrated. Dark and gloomy are its far-off appearances, as from the ship's deck we scan its low, wooded shores, and wonder what manner of living things there be supported by Nature's munificence throughout that ominous region of the unknown. Shall we there meet our dark-skinned brethren slaves to cannibalism and worshippers at the altar of human sacrifice? Or shall we behold the noble sons of Ham as simple children of nature, untouched by vice and uncontaminated by demoralising associations?

Various opinions have from time to time been advanced concerning the physical characteristics of the territory bounded by the Fly and Aird Rivers; the probabilities of communication between the two rivers by water-channels of unknown magnitude have led to many speculative generalisations, both at scientific assemblages and in private controversy. Although previous observations on the lower Fly have furnished no useful data wherewith to confirm this hypothesis, nevertheless the existence of deltaic watercourses of communication may yet be discovered when our acquaintance with

the mangrove regions of these two great rivers is more widely extended. Should, however, these contemplated views eventually assume a mythological character, it is highly probable that the area of low swampy land on the northern side of the Fly River, fringing the Papuan Gulf, will be found to consist of numerous deltaic sections, divided from one another by a system of tidal channels connecting with the primary watercourse of the Fly, while within the southern territory, bounded by the right bank of the Fly and Mai Kussa Rivers, similar conditions may reveal themselves to the searching eyes of thorough exploration, which alone can hope for reward by fresh discoveries in unknown and imperfectly known regions of the earth. The probability of some natural connection, either in the form of swamps, lagoons, or minor streams, between the Fly River and the Mai Kussa estuary is not by any means unlikely ; still less improbable is the possible communication between the former stream and the Katau by the usual tidal estuaries which are almost inseparable from large river systems in tropical latitudes.

In general terms the Fly may properly be described as a mighty island watercourse meandering through British, and, in a lesser degree, Dutch territory, from the German frontiers to the shores of the great Papuan Gulf, draining an enormous area of the southern Papuan slopes, whose surface waters glide along sometimes placidly, and at other places with great impetuosity and numerous sinuosities, and, gracefully reaching the lower deltaic regions, they mingle with the mighty waters of the swelling ocean.

The Fly is augmented by two important tributaries. The first, the Strickland River, from its union with the primary near the eighth parallel of latitude to its probable source in the high mountain regions on the frontier, maintains a general north-easterly course ; and the other inland tributary, the Alice Hargrave River, flows in a general northerly and north-westerly direction through Dutch territory. Chiefly through the explorations of D'Albertis we have for many years past been acquainted with the geographical conditions of

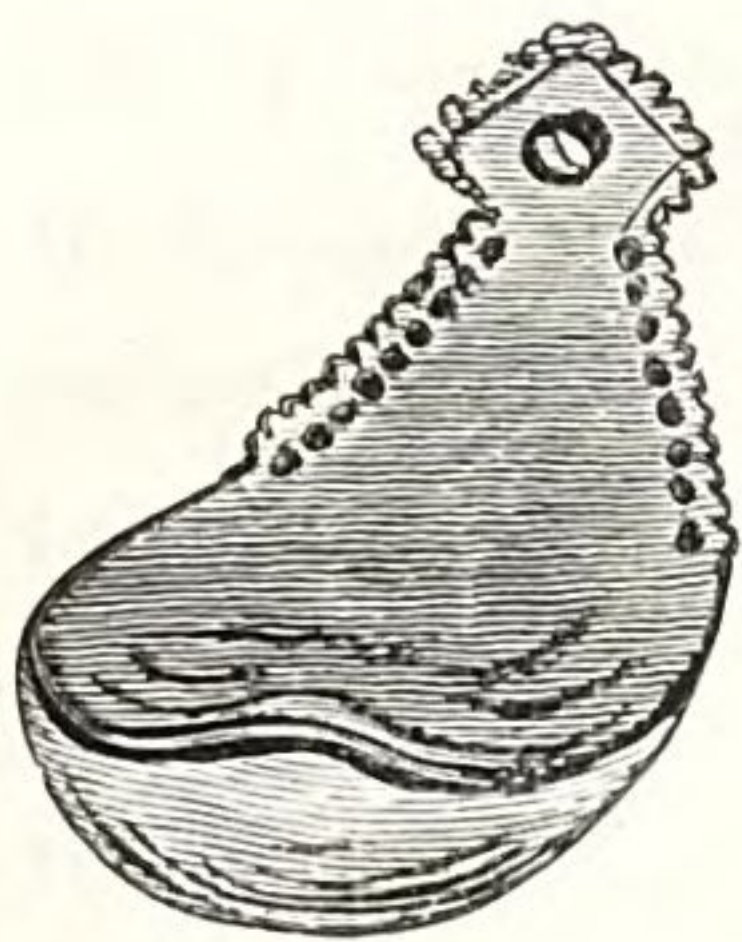
the Fly. This intrepid and accomplished Italian naturalist entered the great river, and navigated its waters in the steam-launch *Neva* for a distance of 454 miles into the interior, carefully noting the character of country along the river-banks. The chief features at the mouth of the Fly River are the islands of Kiwai, Mibu, and Abaura, with others of smaller size between the right bank of the river and the former island. Of alluvial constitution, these river areas are monuments of periodic accumulations, possessing, however, no permanent stability by reason of their subjection to the laws of hydraulic degradation. The augmentation of great flood waters from interior regions, combined with the action of heavy storms and the tides of the ocean, cause some to altogether disappear, others to assume unrecognisable shapes, with corresponding dissimilarity in variety of vegetation and quality of soil, while new island areas are formed in places where their existence was previously unknown, old channels are closed, and fresh openings made in sections formerly occupied by formidable bars. Nor are these transitory characteristics peculiar to island areas alone. The results of geological investigations show us that river beds themselves are subject to great change, either by the combination of natural agencies operating through successive periods, by which the life history of a river may be traced, or by accident, when the rush of flood waters from higher levels burst through channel walls, and, forsaking their former bed, career over fresh fields to lower levels, where surface depressions are filled with the meandering torrents as they gravitate to the ocean. Fortunately these calamitous occurrences are not usual, and are more especially operative in Asia and America than in other parts of the world, where in the former continent the Hoang-Ho, or Yellow River of China, is pre-eminent in its frequent changes of course. The laws of hydraulic degradation, and the methods by which they are accomplished as applying to river-courses, are exhaustively treated of by Major Powell in the November 1888 number of *Science*.

This eminent authority on river engineering problems elucidates the conditions by which channels are cut by the rivers themselves; how loads are deposited in the reaches and at the mouths of rivers, and considerable areas of dry land made to alter their positions, and sometimes altogether disappear by the influence of corrasion. Taking into consideration the sum of the foregoing conditions, it would perhaps appear somewhat inconsistent with the spirit of pioneering enterprise, and opposed to the general interests of geographical science, were the accuracy or value of earlier observations discredited simply because the existing physical features of the deltaic region of the Fly River be not altogether strictly coincident with those of former delineations, more especially in the absence of carefully collated data, which can only be obtained by prolonged professional acquaintance with the region in question.

For the purpose of conducting an exploration of its course, Sir William MacGregor commenced operations at the mouth of the Fly River on November 23rd, 1889. The initial point of the examination of the lower Fly was Kiwai village, on the island of that name. The island of Kiwai is a long narrow tract of land, occupying a central position in the mouth of the Fly River. Longitudinally its measurement is about thirty-six miles parallel to the general current of the river waters, maintaining a breadth of about two and a half miles; its surface, which is flat, and almost level with high-water, is clothed by dense scrub and useless forest. Probably the whole area is diluvium, so that its dimensions are constantly undergoing change, for which reason measurements can be of no permanent value further than as data of comparison. The villages thereon are eleven, seven of which are located upon its south-western aspect, and the remaining four on the north-east side. The number of houses in each village ranges from two to about a dozen, the whole being occupied by a total population of about 5000 souls. The island produces various products, for which reason the advantages it offers to agricultural enterprise are very considerable. Fringing the river bank the cocoa-

nut palms are growing in luxuriant vigour the nuts of which the natives use in their daily food, and trade with to travellers in exchange for articles of equal value. The existence of other fibres, the preparation of which involves less labour than the fibrous husk of the cocoanut, renders the coir of less value than more inferior articles to the natives.

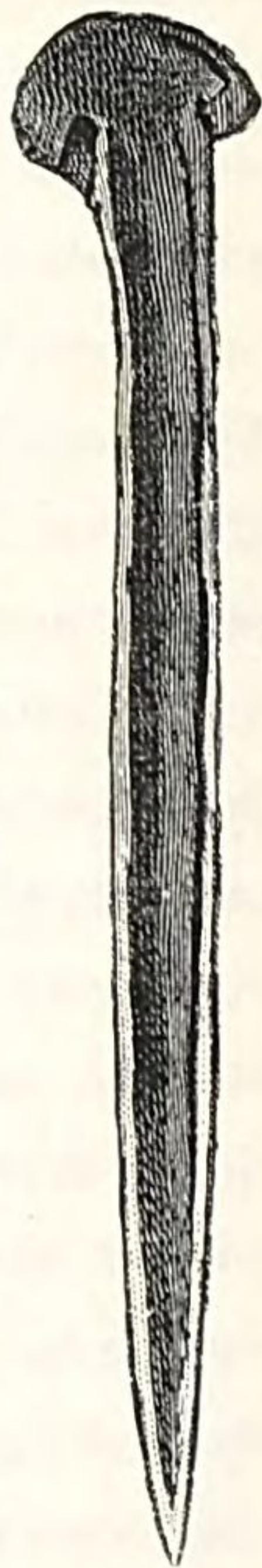
The Kiwai people are great food producers and cultivators of the sago palm; they also occupy much time in the cultivation of the banana, of both of which they produce a number of different varieties. The sago-tree requires



SPOON.

probably about a score of years to mature, at the end of which time the pith is ready for use. It is prepared either by being roasted, or by the usual orthodox method of pie manufacture. Of yams and sweet potatoes they also cultivate many different varieties, some of which are excellent in

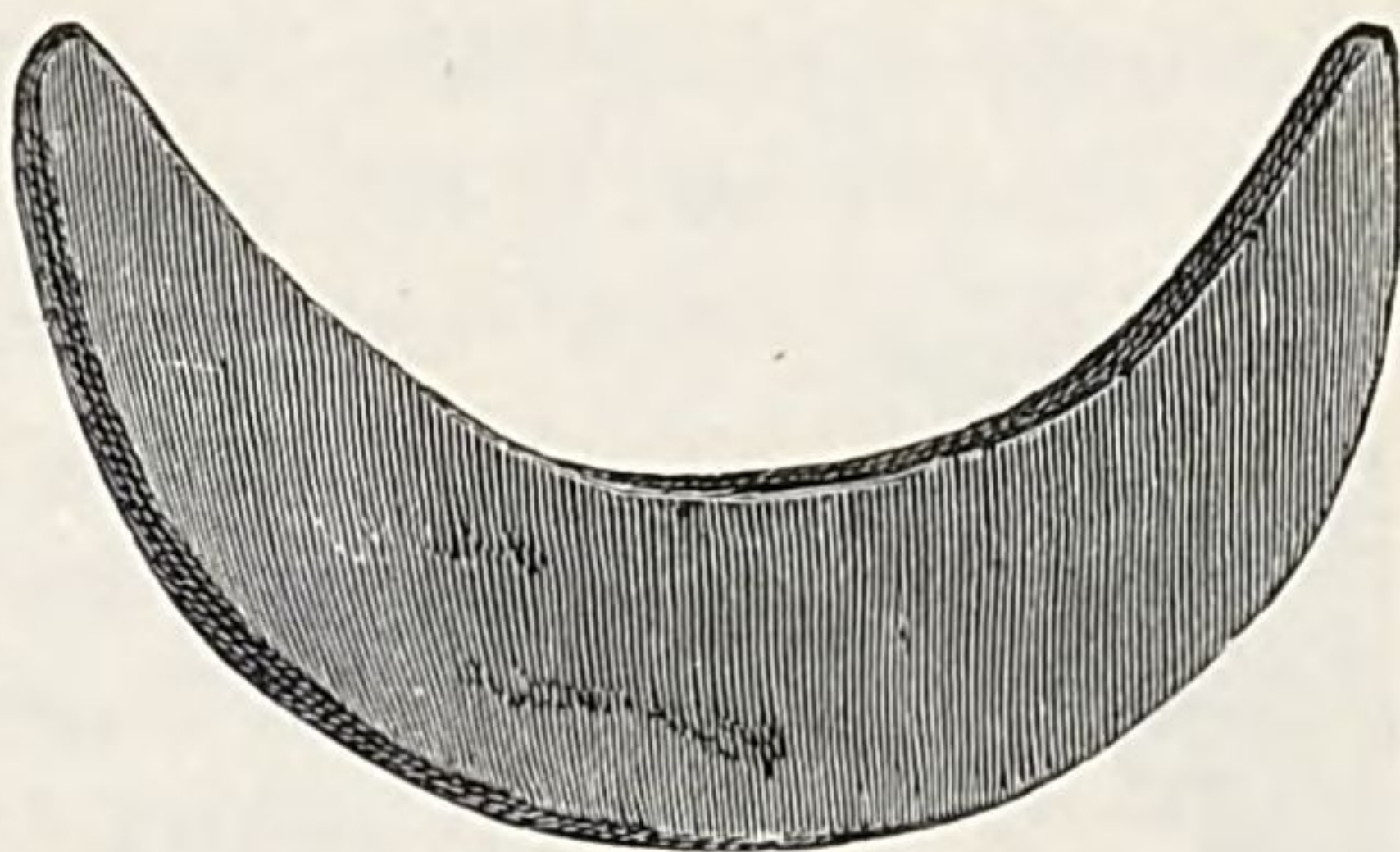
quality. Taro is also one of their products, and bread-fruit trees likewise flourish on the delta. Four or five different kinds of fruit and abundance of sugar-cane grow in the fertile soil. Their animal food consists chiefly of the domestic village porker and the wild pig, also turtle, fish, and shellfish. In the absence of pottery they use for multifarious purposes a large shell, while the leg-bone of the cassowary is used for knives and daggers, and bamboos or cocoanut shells for water-carrying vessels. Articles of food are usually cooked by roasting, either with or without covering. As arms they use the bow and arrow and a few stone clubs with short handles; the bow is made from the bamboo, with string of the same material. The arrow is a shaft of reed, pointed by inserted palm-wood or bone. Tobacco they also cultivate to some considerable extent.

BONE
DAGGER.

It may probably be a question open to some doubt, and certainly

one upon which anthropologists would differ in opinion, as to whether a brief intercourse with the native inhabitants of any country is sufficient to enable us to speak with authority upon their ethnography and ethnology. Nevertheless, it cannot be denied that even a superficial acquaintance may result in many useful observations being recorded, which in future elucidation would be available for comparison. The coastal and more accessible tribes of Papuans must obviously become gradually accustomed to the usages of modern civilisation as the march of British empire extends throughout the land, so that in time their original characteristics will seem a dream of the past and their tribal distinctions more difficult to trace, unless available data are carefully collated and recorded. The word "tribe" is now so generally applied to divisions, in many cases without distinctions sufficient for the purpose of identification, that in ordinary parlance such designation is not infrequently ambiguous and misleading. Separate communities located within a given radius, or even within separate territories, although in dress, tongue, and social habits they may differ, are not always nor necessarily distinct tribes within themselves, however far apart they may be or however greatly their characteristics may differ from one another.

The weaker sex of Kiwai, both young and old, wear dresses after their own peculiar fashions, made from fibre of different kinds and colours, and consisting of simply a covering round the loins. The men ornament their skins with various colours, but neither they nor the women tattoo, although both sexes pierce the septum of the nose. During the period of youth the ear-lobes are distended till they burst, after which the mutilated parts are worn behind the ear in such a form as to project in front. They do not circumcise nor practise any other form of mutilation. They decorate themselves



PEARL SHELL CREST.

with polished shells, coloured fibre inserted in the ear, belts inlaid with the small white cowry shells, the red hibiscus, and with various kinds of feathers. Their music consists of that produced by the



NATIVE ORNAMENTS.

heathen drum and by their own voices. The writer vividly recollects the continuous beat of the drum and the monotonous sound of the native voice resounding through the otherwise stillness of the midnight air, the two combined bidding defiance to sleep and confusing contemplation. Their thoughts of a hereafter are worthy of consideration: all living creatures possess souls and spirits, which, after leaving the mortal frame, wander hither and thither during the hours of the night. They bury their dead in the gardens, each grave being surrounded by a fence some six feet long by about two feet in breadth, the whole being covered by flat boards. After the structure has

BAMBOO MUSICAL
INSTRUMENT.

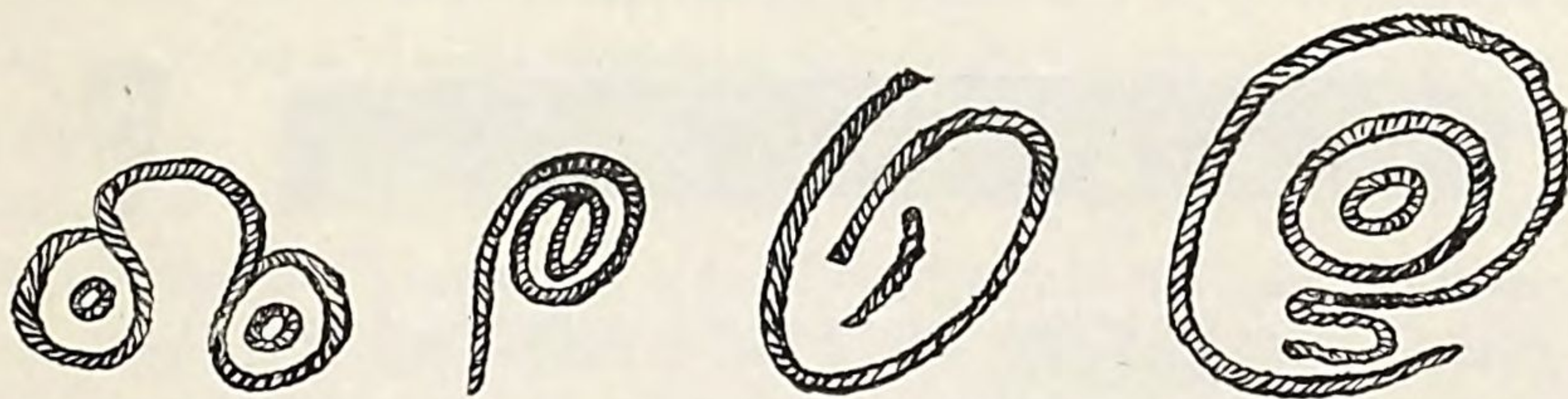
decayed coloured flowers are planted over the spot. Wives are apparently not obtained by purchase, as in the case of marketable goods, although in accordance with time-honoured custom presents are tendered the parents of the bride. They are a polygamous people, some possessing as many as three wives. The intermarriage of village communities is the usual social institution of these people. Young infants are carried in small baskets over the mother's left shoulder. It is a common occurrence to see the mother carrying on her back a basket of food, a large bundle of firewood—both being supported by a band extending round the forehead—and on top of all her little two-year-old baby. Women are truly slaves, who from early life are habituated to the carrying of enormous burdens.

Of great interest to travellers is the almost inexhaustible variety of Papuan architecture, each village being distinguished by some peculiarity in design of buildings. On the lower Fly River region and in the country round the great Papuan Gulf each village usually possesses one house of what may be properly termed enormous dimensions, many being over 500 feet in length. These are usually divided by great passages extending through the centre the entire length of the buildings. From the walls of these aisles the side divisions are subdivided by equidistant partitions, so that the interior section of any one of the buildings resembles that of a stable with its numerous stalls. These subdivisions possess fireplaces, which are used for cooking the family food. The fire is usually kept burning day and night, so as to keep away mosquitoes and other obnoxious insects. These houses are generally provided with end and side doors, the sides usually having several. Notwithstanding this the interior always looks dark and gloomy. The buildings are all raised above the surface of the ground by piles, and in consequence the approaches are unsuited for the booted feet. Sanitary laws in these deltaic regions are very frequently lost sight of, so that it not infrequently happens that some of the villages themselves and their approaches are surrounded by mud and stagnant water, while

others are encroached upon by tidal fluctuations. Although to those not acclimatised these conditions would be most probably inimical, yet the inhabitants themselves apparently suffer no bad effects therefrom, as they enjoy immunity from fever, which to Europeans proves so hostile. The low-lying areas, it is almost needless to say, possess a climate peculiar for excessive moistness. These swamps evaporate by the intense heat of the sun, so that the surrounding atmosphere is highly impregnated with moisture. For this reason the actual shade temperature, which ranges from 85° to 90° Fahr., is not a sufficient guide to actual climatic conditions unless supplemented by a knowledge of the humidity. The people generally are seemingly not unhealthy, notwithstanding the unfavourable conditions of the locality. They are sufferers from ringworm and other diseases of the skin, for none of which they appear to possess specifics. Their canoes seem to be suited only for river and inshore navigation.

The island of Daumori is next in importance to that of Kiwai. Situated about fifteen miles above the latter, it is, in common with others in the neighbourhood, a flat patch of land about two or three feet above high-water level, containing an area of probably six square miles, covered by forest mantle in all parts, excepting where clearings have been made for planting purposes. It is, together with Kiwai, the only habitable island in the lower section of the Fly River. The village, which is situated on the northern side of the island, was constituted of six dwellings, each of which was about 150 feet in length, with interior subdivisions, as observed in other houses. The compartments in this instance were not, however, partitioned. These houses, which were in a somewhat dilapidated condition, did not appear to have much care and attention bestowed upon their sanitary requirements. Entrances to the houses were effected by means of "single-notched" planks of wood inclined from the surface of the ground to the doors of the dwellings. The septum of the nose and the lobes of the ears are pierced, but the inhabitants do not practise tattooing. They move about in a completely nude state, with pro-

bably an inch of the margin of the hairy scalp shaved around the head in the form of a band; the heads of some are further adorned by small curls. The chief of this village, Arāwa by name, is probably thirty years of age, with high nose, tiny eyes, and pointed chin. He evinced excessive timidity notwithstanding the loudness of his voice and fluency of speech. Their war arms, which consisted simply of the bow and arrow, were perceived in great quantities stored in convenient places in the houses. The front parts of two of the houses were ornamented by designs carved on shields of soft wood, which might once have served as the figure-heads of canoes, each of which in form was like an exaggerated human face. As a substitute for tattooing they ornament the surface of the skin



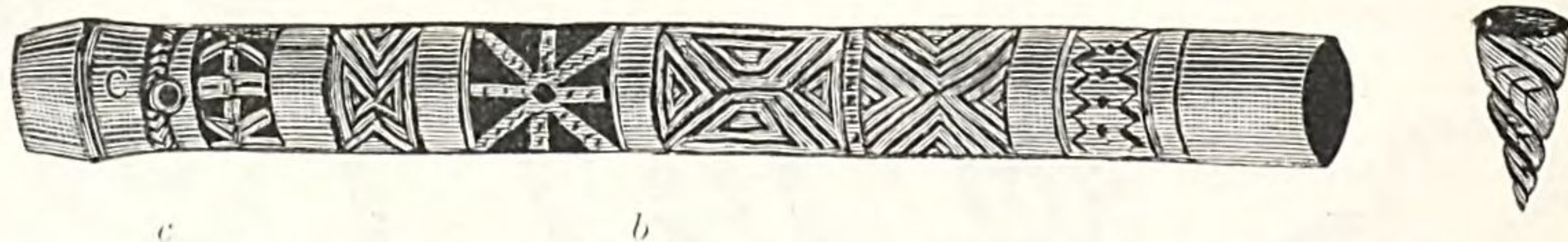
CICATRISED FIGURES.

by the cicatrised figures, the patterns of which resemble the subjoined illustrations. Ringworm, hydrocele, and lupus were the only diseases from which these people appeared to suffer. They are an agricultural people, living by the products of the soil, which consist chiefly of bananas and sweet potatoes. The former, which occupied plantations embracing an aggregate area of probably fifty acres, were of good flavour; there were several varieties, some of which appeared to be new. The cocoanut palm grows on the island, but not to any great extent; the same may also be said of the bread-fruit tree, although the quality of its fruit is very inferior. The inhabitants also grow the *Piper methysticum*, but do not appear to habitually make use of its properties as a national beverage. Turtle skeletons were seen in considerable numbers in the village.

The turtles are captured in the river by means of large-meshed nets. The people are enthusiastic consumers of tobacco, which they smoke from the orthodox bamboo pipe about twenty inches in length.

These agricultural people of Daumori, the entire population of which numbers probably about 300 souls, are of a friendly disposition, lively in temperament, and neither suspicious nor apparently distrustful, and will doubtless be of some use as food producers for those whose operations in the British Possession may be confined to the deltaic regions of the Fly.

Situated on the margin of a small creek on the right bank of the River Fly, at a point about fifty-one miles from its mouth, the geographical position of which was estimated to be in longitude probably $142^{\circ} 55'$ E. and latitude by observation $8^{\circ} 28'$ S., is the



- a.* Bowl of pipe, of green leaf twisted in the form of a cone.
- b.* Bamboo stem.
- c.* Small hole in which bowl is inserted.

interesting village of Odagositia, with its enormously long house and two or three small ones located upon a site not more than about two feet above the tidal high-water level, probably three-quarters of a mile from the margin of the Fly.

This village is in the midst of a beautiful grove of the cocoanut palm, and the intervening space between it and the river is covered by young trees. The surface of this ground, which is traversed by ditches of about four feet wide and probably a similar measurement in depth, about 200 yards apart, through which the drainage water constantly flows, shows evident indications of its being formerly under cultivation. The village site has evidently been selected some distance from the river for the purpose of hiding its existence from the curious eyes of strangers. It was first visited by Captain Hennessy of the *Merrie England*, who, in an interesting

contribution to the Royal Geographical Society of Australasia, Queensland Branch, gave an accurate and graphic description of its houses. The largest of these, which was supported by five rows of posts, some of which were two feet in diameter, was 520 feet long by thirty feet wide in the inside. The central part of the house was occupied by a wide aisle extending the entire length of the building. The sections on each side of this great passage were subdivided by upright posts into numerous quarters for the use of different family groups. The central transverse compartment, which was completely enclosed by a palm-leaf partition, presented a mysterious appearance. Its inspection was firmly opposed, for which reason no useful description of its interior could be given, but it could scarcely be doubted that it was used in some way as a heathen temple. The floor of the dwelling was covered by split palm-trees laid down with the smooth surface uppermost. The roof, which was slightly curved, was thatched with leaves of palms sewn together and placed in regular order. Each subdivision was occupied by a fireplace, over which a framework was constructed for the storage of the family property. A remarkable feature about this interesting building was the scrupulous cleanliness which in its interior was everywhere met with. Goods and chattels and everything contained therein were carefully assigned to their proper places, so that the whole organisation maintained perfect order not unworthy of emulation by a higher order of civilisation. The doorposts of the house were ornamented by carvings and paintings representing the human hand, foot, and arm, and the roof-tree was also decorated by palm-leaves, wrought into various designs, suspended therefrom. The many side doors gave to the interior of the dwelling a fair admission of light, not usually met with in similar habitations in these parts of the Papuan territory. On the floor of the house in proximity to the door were laid out in order five conch shells, in front of which row were also placed two ornamentations of brown beans, into which were set small red seeds and a single white feather, probably a foot in length—this was stuck into

the centre of the bean. The front partition of the central temple was adorned by bunches of the leaf of the sago-palm in the form of ribbons, and by three eggs of the *Megapodius tumulus*.

The chief of this village, Damo by name, who was timid and distrustful, is a man of about thirty-five years of age, possessing an apparently highly nervous temperament, so that, notwithstanding the attention he received on board the *Merrie England*, whither after much patient persuasion he was induced to go, his suspicious tendencies could not be overcome. The shooting gauntlet is worn by the men, and against the subdivision posts of the house bows and bundles of arrows were stacked ready for use at the shortest notice. Although friendly in demeanour, they were obviously distrustful, and their powerful warlike appearance will doubtless cause strangers to approach them with certain caution, which would probably be equally advantageous to all concerned. As is the case with their neighbours, these people are apparently agriculturists—they plant bananas, and possess a great deal of sago. From the low swampy nature of the ground the process of cultivation is, with these lords of the soil, a somewhat difficult and tedious task. The surface water has to be drained off by ditches, the digging of which is taken part in by men, women, and children. The men move about naked, but the women are covered by the orthodox loin dress. As on Kiwai, the ears and septum of the nose are pierced and ornamented, and the men wear a tribal crest marked on the surface of the skin, generally on the left shoulder, by the usual method of cicatrising, which in form resembles



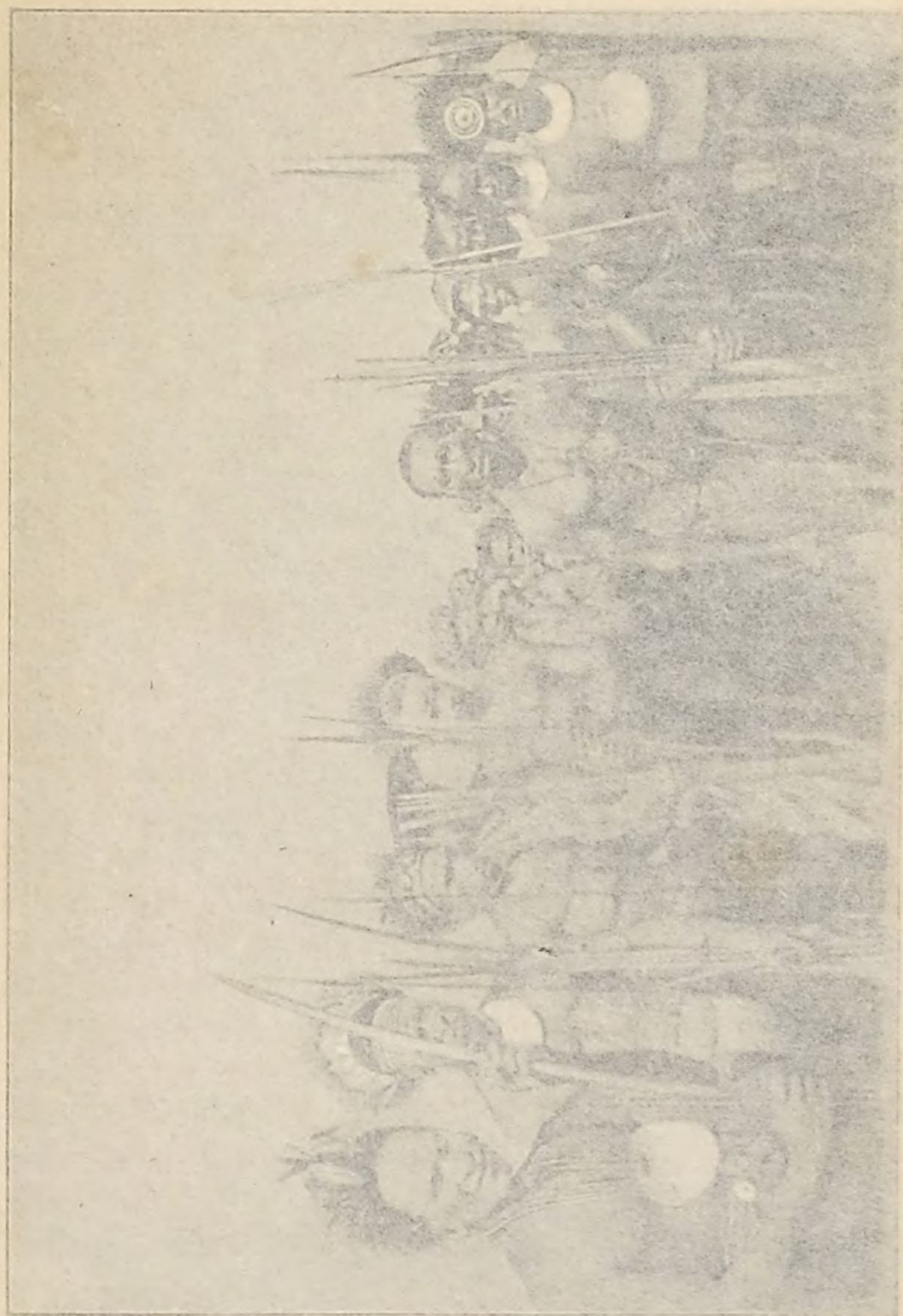
TRIBAL CREST.

the subjoined illustration. It is somewhat remarkable that this form of marking the surface of the skin is practised over a very wide geographical range, and is not by any means peculiar to Papua and the adjacent islands thereof—it is met with all over the islands of the Western Pacific. In some places it appears as parallel bars across the arm and the breast; sometimes it is met with in the form of round lumps of elevation on the back and shoulder.

Probably each tribe or race has markings peculiar to itself by which its members are able to distinguish one another with perfect ease. The designs, which are not altogether void of beauty, are without doubt of a permanent character, and the scars do not appear to cause the owners any inconvenience after they are completely healed. They are smooth, glossy, and hard to the touch.

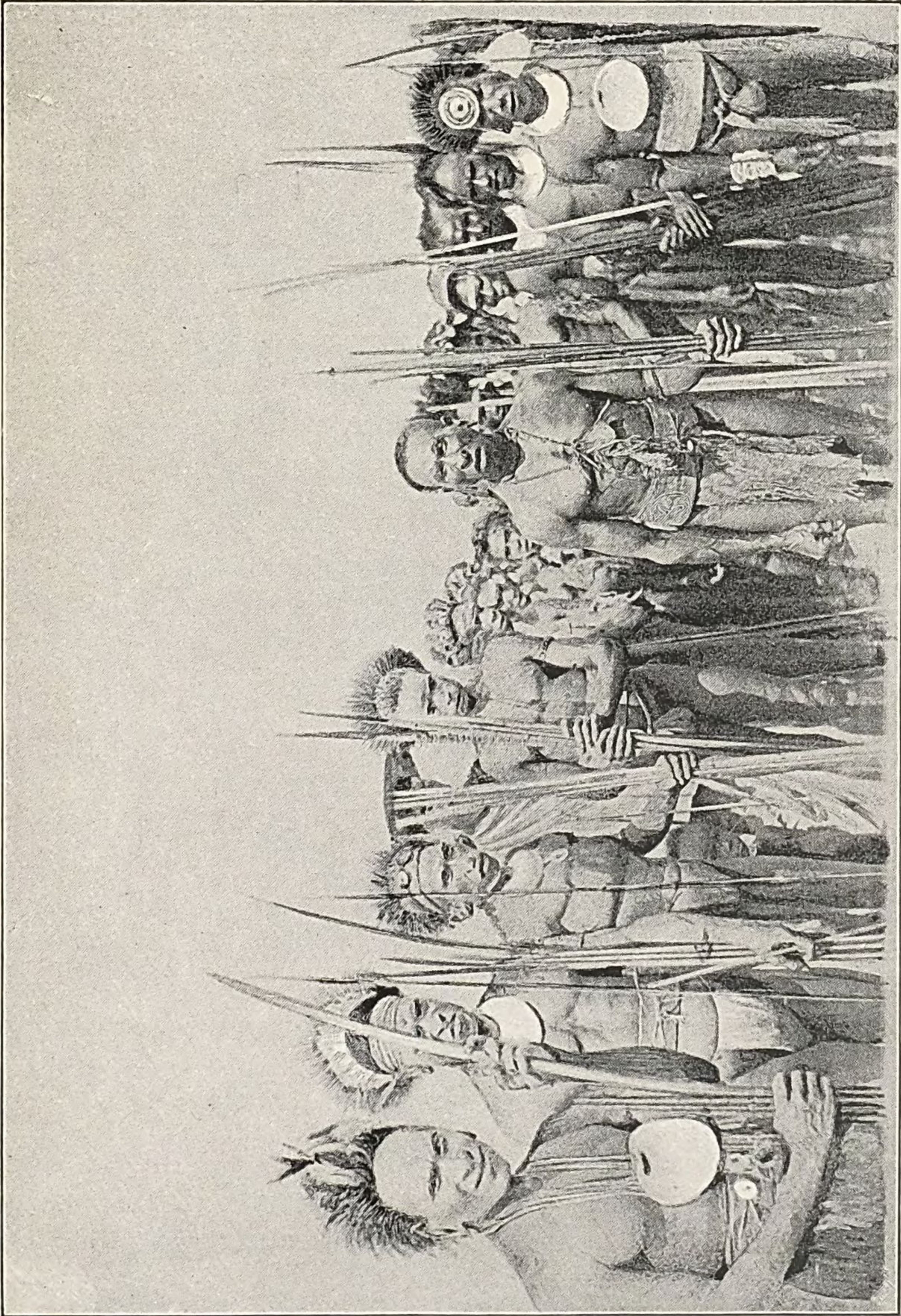
From the island of Daumori to the village of Tagota, being a distance of about twenty-eight miles, the river maintains a westerly course, with its channel in several places occupied by islands and mud-flats. The left bank of this section, which is extremely low, is covered by a forest mantle, and exhibits no apparent indications of native occupation; the right bank is, however, occupied by villages. When proceeding up the river in the steam launch for the purpose of forming a coal dépôt, Sir William MacGregor and party were attacked by a powerful body of native warriors. The expedition had anchored the launch and whale-boat during the night near the village of Tagota. Most of the party camped on shore on the left bank of the river opposite the village, and when operations were about to be resumed on the following morning it was found that both launch and whale-boat, full of coal, had been left dry on the mud-flat by the receding tide. This was an unfortunate occurrence, and a most undesirable position to be placed in by a small party in a hostile country; however, nothing serious was anticipated until their movements clearly indicated the contemplation of aggression by the natives on the opposite shore. Canoes were observed to leave the right bank of the river and take up a position in mid-stream, until the whole flotilla, numbering fifteen war canoes, containing about 100 men, had marshalled themselves into proper order, ready for the attack. This unexpected warlike demonstration caused some considerable anxiety to the expedition, which was at that time occupying a most disadvantageous position, through the force of unforeseen circumstances, which nothing but the action of natural causes could possibly improve. The canoes, which moved about in single file,

commenced operations by paddling round the southern end of a sand-spit which intervened between them and the expedition. This they did in graceful order, the paddle strokes being so completely simultaneous as to cause the reverberated sounds to be distinctly heard in the camp. The position of the expedition became a very critical one, owing chiefly to the scattered state of its members, some of whom were on board the grounded launch; others, four Polynesians, were endeavouring to float the boat, so that the land forces only numbered three Europeans and two Polynesians stationed on the river bank to receive the charge of the Papuan phalanx. In a fair field this number would have probably sufficed to maintain the position against the whole concentrated Papuan force, *cæteris paribus*, but the danger of the position was increased by the probability of the natives landing detachments and storming the rear quarters. This would by no means have been impracticable, as, having once effected a landing either above or below, the friendly cover of the jungle would have afforded access to the position which the expedition occupied. To guard against the probability of such a movement, and to reduce their advantages to a minimum, it was quickly determined to oppose their landing on any part of the occupied bank of the river. It was the more desirable that success should attend these efforts for the purpose of concealing the disadvantageousness of their position. Forming themselves into circular order, at a place about 1000 yards distant, the canoes, after rounding the end of the sand-spit, proceeded to exhibit peculiar demonstrative movements which were of a somewhat amusing character, notwithstanding their Papuan origin and hostile intent. Standing erect in their canoes, the gallant warriors, upon whose heads the feathery tufts of the gorgeously plumaged birds of the forest waved majestically, and whose breastplates of shell flashed in the sunlight, dipped and waved their canoe paddles with striking regularity, while, accompanying these gesticulations, the canoes moved backwards and forwards in dance order to the



GROUP OF NINE GUINIA WARRIORS

commenced operations by paddling round the southern end of a sand-spit which intervened between them and the expedition. This they did in graceful order, the paddle strokes being so completely synchronous as to cause the reverberated sounds to be distinctly heard by the camp. The position of the expedition became a very difficult one, owing chiefly to the shattered state of its members, some of whom were on board the grounded launch; others, four Polynesians, were endeavouring to float the boat, so that the land forces only numbered three Europeans and two Polynesians stationed on the low bank to receive the charge of the Papuan phalanx. In a very bold and desperate assault would have probably sufficed to maintain the position against the whole concentrated Papuan force, *ceteris paribus*, but the danger of the position was increased by the probability of the natives finding their way to the rear quarters. The route by the river would have been impracticable, as, having once effected a landing either above or below, the friendly cover of the jungle would have afforded access to the position which the expedition occupied. To guard against the probability of such a movement and to reduce their advantages to a minimum, it was hastily determined to oppose their landing on any part of the exposed bank of the river. It was the more desirable that success should attend these efforts for the purpose of concealing the disadvantages of their position. Forming themselves into circular rows at a place about 1000 yards distant, the canoes, after rounding the end of the sand-spit, proceeded to exhibit peculiar demonstrative postures which were of a somewhat amusing character. The natives were of Papuan origin and hostile intent. Arranging themselves in three rows, the gallant warriors, upon whose heads the feathers of the gorgeously plumaged birds of the forest were conspicuously worn, and whose breastplates of shell flashed in the sunlight, waved their canoe paddles with striking regularity, while accompanying these gesticulations, the canoes moved backwards and forwards in dance order to the



GROUP OF NEW GUINEA WARRIORS.

melodious strains of song imitative of the forest doves. After the termination of this entertaining performance, so eagerly witnessed by the expedition, which was by no means sure of the tenableness of its position, the flotilla moved at a given signal to the attack. Observing that pacific demonstrations were no longer practicable, and that decisive defensive measures were imperative for the safety of the scattered party, the available Martini-Henry rifles were brought to bear upon the Papuan forces, which were completely routed after a few shots had been fired. As no provocation had been given, and no hostile demonstrations had previously been observed, the reasons for this attack could not be assigned. After the launch and boat had been floated the village of Tagota was visited, where the assailants were met with. Shy and suspicious at first, they soon regained courage, and friendly relations were subsequently established.

Tagota village, built upon a position elevated a few feet above the level of high-water, is composed of about eight houses, each of which is probably 100 feet in length, and similar in architectural design to those of the lower Fly region. The chief, Gruo, who is about fifty years of age, was kind, and pledged himself to future friendship. The people wore no clothes, nor were there any indications of the necessary material for the covering of the body in the village. The region of the shoulder-joint was ornamented by the usual cicatrised marking, probably the tribal token, as shown in the accompanying illustration.



TRIBAL TOKEN.

From the village of Tagota to a point the geographical position of which is about 180 miles from the lower end of Kiwai, at which place a coal depôt was established, the general aspect of the country is dreary and unattractive. The banks of the river, and probably a very considerable marginal area, are densely clothed with large trees interlaced by strong lawyer vines and other forms of vegetation, which are so close as to almost defy penetration. This forest mantle is apparently quite unproductive of food suitable for the

human race. The low swampy character of the country, which was generally raised but a few feet above the surface of the river waters, combined with other conditions of climate and surroundings, gave this region an aspect by no means favourable to European occupation and development. As, however, an examination of the country extending beyond the immediate river fringe was not attempted, these remarks must necessarily apply only to a comparatively limited area. It was nevertheless apparent that the river areas suitable, by reason of their elevation, for occupation, are fully populated by an agricultural people, warlike in their movements. These native inhabitants live and move in tribal order. Some of them are evidently permanent occupiers of their holdings, while others are simply itinerants. Although the low swampy physical character of the regions of the lower Fly renders their climatic conditions inimical to European settlement, the probabilities are that the extensive areas which now are sterile, owing to their partial or entire immersion in the surplus waters of the Fly, may in future be utilised as fields for the growing of rice. At a place in latitude $7^{\circ} 53'$ S. and longitude probably $141^{\circ} 47'$ E., the coal depôt was established, after which the party returned to the *Merric England*, where preparations were proceeded with for the purpose of undertaking the exploration of the middle and upper regions of the Fly. Tidal influence was not observed above 150 miles from the mouth of the river. The flora and fauna of these regions, which were limited and unattractive, appeared harmonious with the local surroundings.

CHAPTER IX.

MIDDLE AND UPPER FLY RIVER.

"The river, small and clear in its origin, gushes forth from rocks, falls into deep glens, and wantons and meanders through a wild and picturesque country, nourishing only the uncultivated tree or flower by its dew or spray."—SIR H. DAVY.

AFTER the examination of Kiwai and its deltaic regions had been completed, Sir William MacGregor and party proceeded to the ascent of the Fly River for the purpose of exploring its middle and upper sections. Starting from the village of Odagositia on the 26th December 1889, in the steam launch *Ruby*, with two whale-boats in tow, the limit of tidal influence was reached at a place about 150 miles from the river's mouth. Fair weather was experienced in the daytime, but during the night rain fell in showers. Thermometric measurements indicated a temperature of 85° Fahr. in the shade during the day and a reduction of 10° at night, the wide range for this latitude being most probably due to an evening storm. On the right bank of the river, near the coal depôt, a number of old hunting camps were observed among the trees. It was also observed that the red creeper mentioned by D'Albertis was not abundant at this place. From thirty to fifty large bunches of brilliant scarlet flowers would be attached to each plant, which were often separated by several miles. Its successful propagation elsewhere would, it was thought, be difficult. A fine specimen of the spotted cuscus and a few game birds were procured. Advantage was taken of what appeared to be the normal condition of the river to estimate its volume. At a place just beyond the limit of tidal influence the measurements of the cross section of the river indicated an average depth of 39 feet, an average rate of current of 3.25 miles per

hour, and a width of 600 yards. These data show a probable volume of about 180 thousand millions of gallons discharged by the Fly River in twenty-four hours. These waters, as is usually the case in tropical rivers during the rainy season, held in suspension large quantities of soil.

Continuing the ascent of the river, at places against a strong current, Ellengowan Island was reached. This island is about three-fourths of a mile in length, with its upper and lower ends clothed with forest and the intermediate section with wild cane and reeds; at many places along the margin of the river vegetation of a similar character grows. The river here is very tortuous, the general conditions of the country disappointing, and from the dead and dwarfed condition of the timber the locality evidently suffered much from inundations through the overflow of the river waters during periods of heavy interior rain. Wild bananas and bread-fruit trees, which seldom bear fruit, grew at several places. A few cedar-trees, malava, nutmeg, and sago-palms were also met with, but of grass there appeared to be none. No recent traces of natives were observed, but a clearing that may at one time have been the site of a village was noticed on the right bank of the river above Ellengowan Island. The shade temperature did not rise above 86° Fahr.

No apparent characteristic changes were observed in the physical aspect of the country up to the confluence of the Fly and Strickland Rivers. As formerly mentioned, the latter stream was explored in 1885 by the Royal Geographical Society of Australasia's expedition, which bestowed upon it the name of the distinguished president of the New South Wales branch of this Society, the late Sir Edward Strickland, K.C.B., F.R.G.S., who since his connection with our national geographical institution had evinced the warmest interest in all matters appertaining to the progress of geography as well as a sympathetic feeling with the ambition of our youthful struggles. To the place of union of these two streams Sir William MacGregor applied the name of Everill Junction. From approximate measure-

ments of the two rivers we find the Strickland 32 feet in depth, 420 yards in width, with a current flowing at the rate of 3.3 miles per hour, which indicate a discharge of about 106 thousand millions of gallons in twenty-four hours; and the Fly 42 feet in depth, 302 yards in width, with the current circulating 1.5 miles an hour, and the volume of water discharged by it in twenty-four hours about 45 thousand million of gallons. Below the confluence of the Strickland the Fly is about 1000 yards in breadth. Along the left bank of the Strickland for some distance, also along the margins of the Fly below Everill Junction, the country is clothed with forest, and maintains an elevation of two or three yards above the ordinary water level, but for forty or fifty miles above that junction the region bordering on the Fly consists generally of swamps and lagoons interspersed with belts of trees. This section of the river is deep, and the current moves at the rate of about two miles per hour. A large village was observed about a mile and a half from the river, formed on a long ridge of red clay about fifty or sixty feet above the plain, and about two or three miles in length. It contained about thirty houses, each from fifty to seventy yards in length. It is separated from the river by an extensive swamp, which doubtless renders access thereto somewhat difficult. Columns of smoke were also seen issuing from a dense part of the forest about seven or eight miles from the river, probably the locality used for food plantations. In a clump of bamboos on the right bank of the river several natives were descried crouching under friendly cover; they had a canoe fastened to the river bank, and efforts were made to induce them to enter into friendly intercourse, but without success. After a further ascent of two or three miles of the river channel another village appeared in view. It was located upon a small hill of sixty or seventy feet in height, and beautified by the cocoanut palm. Being about the same distance from the river as the former village, it was also rendered probably more difficult of access by reason of the swampy nature of the country intervening. The people of these villages appeared to

be settled cultivators of the soil, occupying all the available land out of flood reach. The absence of canoes would also indicate that river traffic was not carried on by them to any extent. No pigeons were met with in this region, but of geese, ducks, hornbills, parrots, and cockatoos there were plenty. These were, however, somewhat difficult to obtain. When proceeding up the river on the forenoon of the 2nd January, a canoe containing three natives was seen, but before advances could be made they had hastily disappeared under cover of the wild cane.

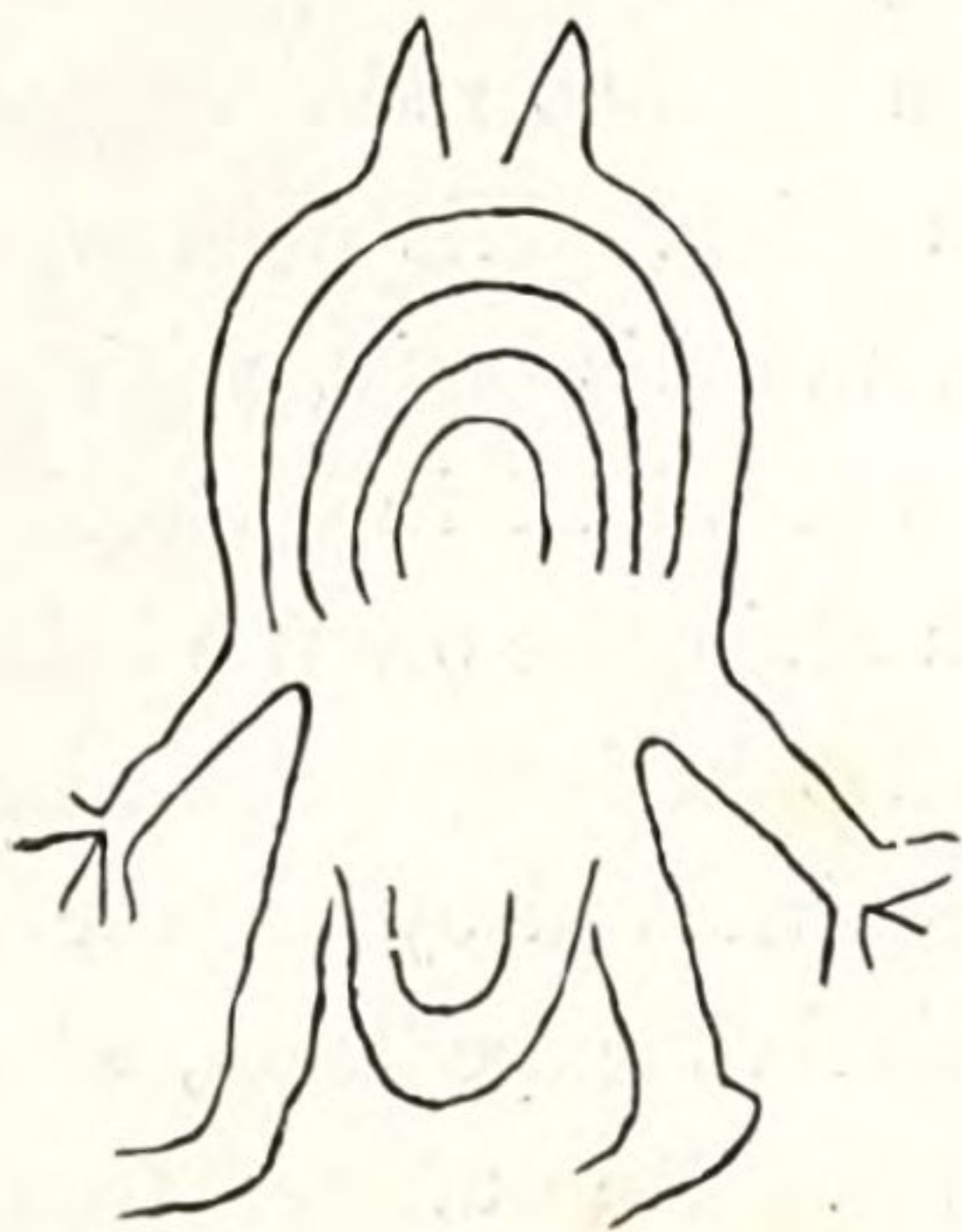
The general aspect of this district is dull and uninviting; even the vegetation would lack interest and apparent vitality but for the occurrence of the beautiful water-lily, which grows luxuriantly in the lagoons. When fully expanded the flower is about ten inches across, delicately pink in colour. Each flower possesses from sixteen to twenty petals of from four to five inches in length and from three to four inches in breadth respectively. A bright yellow cavity, with its upper surface flat, and containing from twenty-four to thirty-three seeds, occupies the central section of the flower; these when fully ripe are as large as French beans. The whole of this internal division is surrounded by from four to five hundred stamens. The stalks, each of which support a flower and a leaf, are about four feet long, and three-fourths of an inch in thickness. Of a deep green, the leaf is circular, and exceeds two feet in diameter, with a central stem. The appearance of this luxuriant plant was very beautiful when viewed in all its richness of colour spread over the surfaces of the large lagoons. Its geographical range is apparently circumscribed within a division of about thirty miles along the Fly, being first met with about seven miles above Everill Junction. The occurrence of a large tree, probably a *Lagerstræmia*, in places along the banks of the river in this district, also lends beauty in season by the pink and purple colours of its copious blossoms. Thirty miles above Everill Junction two small cocoanut plantations were seen, and some low grassy hills of about forty feet above the plain were also observed.

A short distance above this point a few natives were met with, but, although friendly advances were made and small presents left in their canoe, they could not be induced to hold intercourse.

Proceeding up the river for some distance farther, the expedition was next day visited by several natives, who approached the launch in canoes. Friendly intercourse was initiated by an interchange of civilities through the use of the word *sambi* between the expedition and a young savage of about twenty-five years of age, about five feet three inches in height, with hair hanging down over the top of his head to below the shoulder-blades, plaited with fibre into a number of pendants. His ears were ornamented with rings of cassowary quills, and the septum of his nose was adorned with a bamboo rod of three inches in length and three-quarters of an inch thick. His neck was encircled by a necklace of *coix lacyma* seeds, and his waist with a plaited belt of yellow and black fibre an inch and a half in breadth; a posterior pendant of grass was attached to a string below the belt, and in front a marine shell of about four inches in length was also suspended. This peculiar shell suspender was observed by members of the Royal Geographical Society of Australasia's expedition, who met with it first among the Fly River natives. He suffered from ringworm, and his skin was besmeared in patches with charcoal; a cicatrix, in the form of a crescent about three inches long, served as an ornament of a permanent character in the skin of the breast. The bow gauntlet he wore was composed of wood, and in the canoe his bow and sheaf of arrows were ready for use. Probably made by the stone adze, the canoe, which had no outrigger, was from twelve to fifteen feet in length, sharp at both ends, ten inches in breadth, and about the same in depth. The handle of the paddle was about twelve feet long, with a blade measuring eighteen inches by ten inches. These natives were very interesting, and the intercourse held between them and the expedition was characterised by demonstrations of cordial friendship. The first of these to approach the boats of the expedition, who has just been described, evinced great and unusual hilarity of

spirits when he found himself unhurt by his European visitors. He was very inquisitive, and particularly anxious to examine everything within his reach; the steam launch appeared to greatly perplex his savage mind.

D'Albertis' Attack Point was next passed, near which, on the river's right bank, there existed a large fen. On the opposite bank, which was about nine feet high, some soft wood was growing, and on the surface there occurred the traces of native camps. Near this place stood a stately palm-tree, upon which the subjoined



NATIVE DRAWING.

representation of the human form was delineated by a native follower of the fine arts. The substances used to produce the colours were apparently red clay and charcoal. This remarkable picture, which was three feet in length, was the only exhibition of the human form executed by a local artist met with on the upper Fly. The weather continued fine during the forenoons, with late afternoon showers; the maximum and minimum temperature was 85° and 75° Fahr. respectively. For the better safety of the expedition against possible night attacks in this strange part of

the territory, split-log enclosures about four and a half feet high were constructed round the sleeping-tents, which were usually pitched on the river bank. The form of this barricade was always that best suited to the requirements of the locality and the general character of the surface. As the supply of suitable fuel for the steam launch had hitherto taxed the resources of the expedition, the discovery of a tree possessing special properties as a heat producer was hailed by all with great delight. The wood of this tree, which occurs along the whole course of the river, is light, easily cut and split; its timber is porous, but not resinous. When old the trees are lofty, with a trunk branchless for about two-thirds of its length from

the ground. The presence of small lichens makes the bark appear grey in colour. It is somewhat conspicuous by its light green leaves, which are about four or five inches long, and two and a half inches in breadth, rather thin and uneven; it produces a very small white flower, and fruit similar in external appearance to a half-grown coffee berry. In latitude $7^{\circ} 3' S.$ the river, which is very tortuous, with remarkably low swampy banks, varies in width from 150 to 350 yards, with a current of two or three miles per hour. On its right side some low hills of from thirty to forty feet in height were seen, upon which a few of the cocoanut palms were growing. About half this district is of a low swampy nature, and too wet to grow even timber. A canoe occupied by three men was met with, but as soon as the expedition was observed they fastened their canoe to the bank of the river and disappeared in the jungle. The canoe was examined, and found to contain, besides their bows and arrows, the flowering shoots of wild cane made up in bundles, probably for use as food. A present was left in the canoe, and none of its contents were touched. For the next twenty or thirty miles the aspect of the region maintained its monotony, being uninhabited and unfit for habitation owing to its low swampy nature.

The climatological features of the district were of a more modified character than those of lower regions. The early mornings were characterised by an overcast sky of dull grey leaden clouds, which, as the sun's altitude increased, were dispersed and transformed towards noon into white masses, which again changed in the afternoon into ponderous black thunder-clouds. On the 6th January the first indications of grassy patches were met with, the febrile zone of gloomy fen was passed, and the margin of dry firm land reached. Near one of its sharp bends, where the river banks were about fifty feet in height, a village inhabited by what appeared to be a hostile and warlike people was met with. The houses were seventeen in number, each from thirty to fifty feet in length. As this village was approached, about one hundred men, armed with

bows and arrows, were drawn up in array on the margin of the river in front of it. Nearly every warrior was besmeared with sundry colours, and wore an ornamentation on the head of the wing and tail feathers of the white cockatoo, arranged and bound together in a framework of cane in the shape of a crescent, which

extended from ear to ear (see illustration). The

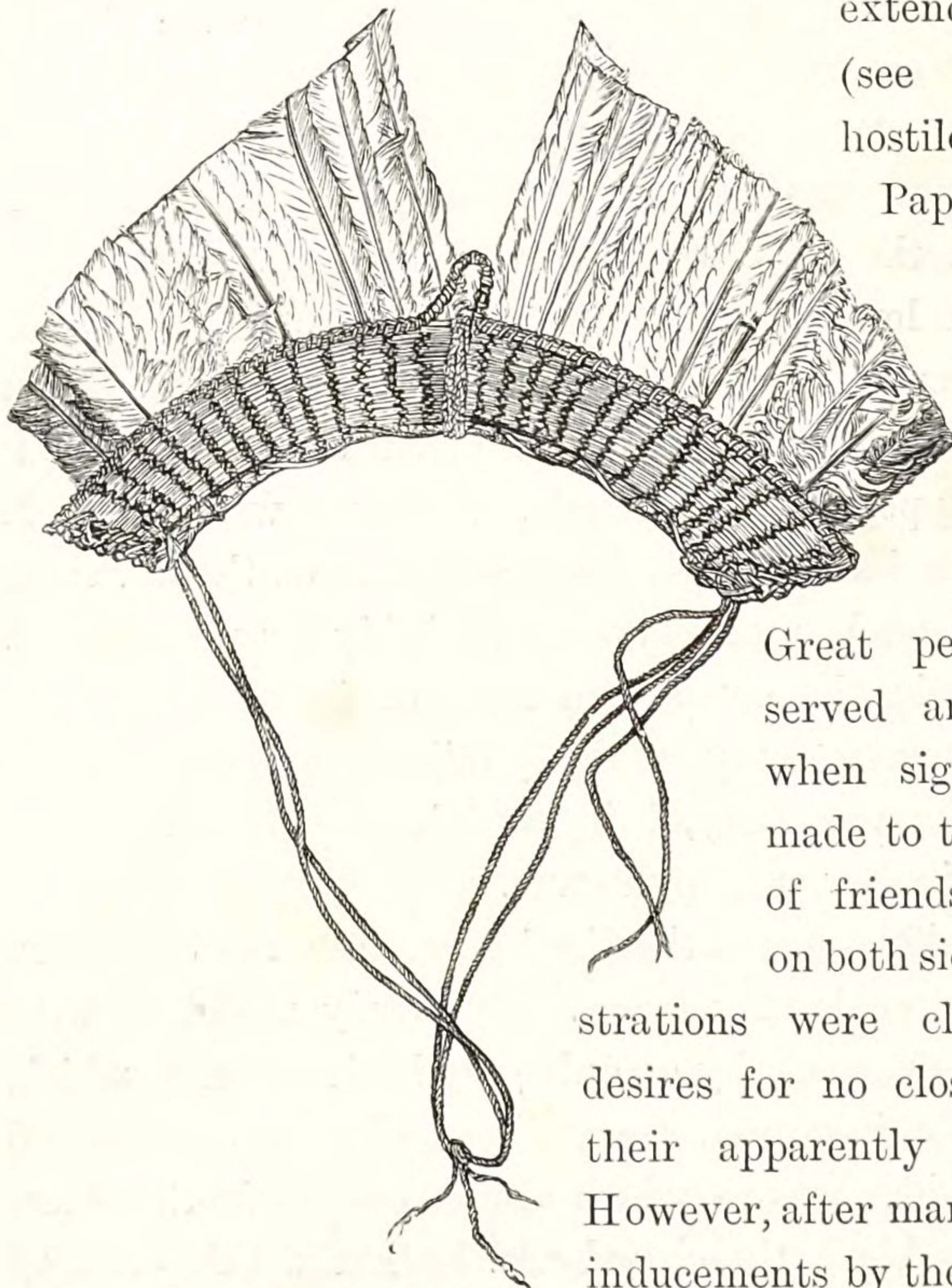
hostile aspect of these noble

Papuans induced the ex-

pedition to halt about 200 yards from the shore opposite the village, where the river was 300 yards in width.

Great perturbation was observed amongst the natives when signals of peace were made to them. The password of friendship was exchanged on both sides; but their demon-

strations were clearly indicative of desires for no closer intercourse with their apparently unwelcome visitors. However, after many gesticulations, and inducements by the charms of red cloth, tomahawks and knives, they approached



FEATHER HEAD ORNAMENT.

the edge of the water holding their canoe paddles, and some of the older men embarked in their canoes, evidently intending to approach the expedition, but were then restrained from doing so by the impetuosity of the youthful element, who were manifestly eager to gain distinction in the battle-field, a pleasure denied those juvenile braves by the majority of elderly counsels. They

wore well-made gauntlets of cane plaited on split bamboo, into the upper end of which were fastened plumes of from three to four feet long, of black cassowary feathers, or the feathers of the white cockatoo. These were worn on the left forearm, and extended to the elbow joint. The peculiar gesticulations of the young men were watched with much interest, as they flourished in the most pronounced manner their weapons of war, and waved their plumes to the flowing breeze by a singular motion of the left arm. Paddles were grasped as the excitement increased, and the canoes were launched into the water by these impetuous juvenile warriors, who assumed a boldness which, but for subsequent events, would have partaken more of the heroic. Seeing a want of unanimity of sentiment, and a desire on the part of the senior section of the tribe to avoid collision, these turbulent youths without any apparent reluctance returned to the shore. Observing an entire absence of hostility on the part of the expedition, and the many friendly demonstrations offered, some of the older men timidly approached the boats, which were at anchor, and anxiously inquired about "Pu, pu," which was understood to signify gun. Evidently they had previously had intercourse with Europeans; probably D'Albertis had met with them. After many invitations some were induced near enough to receive some small presents, but the roar of escaping steam was sufficient to destroy all confidence, and they quickly dispersed for the shore. Observing this, the expedition proceeded to the village, where after many difficulties friendly relations were at last established, but not before several hairbreadth escapes from collision had been experienced. Conspicuous amongst these barbarians were two individuals who appeared somewhat in pantomimic character. One was bedaubed with lime from the crown of his head to the soles of his feet. This interesting subject, who was tall, with red eyes, and armed with the bow and arrow, appeared to exercise considerable influence amongst his clansmen. The other character was besmeared with white and black substances equal in degree. A few articles

were purchased, but no food could be procured from them. In dress and personal adornment they were in every respect similar to the tribes previously met with in lower regions. The women, who were kept at a distance, wore petticoats like those worn at Port Moresby. Built on piles, and about thirty feet square, without gable ends, the houses were of an inferior order to those of other localities. Two unimportant garden patches, within which were growing wild bananas, sugar cane, and sweet potatoes, were connected with the village. Their canoes, of which they possessed about twenty, were twenty to thirty feet in length and fifteen inches in breadth, having no outriggers, with long projecting prows flat on the upper surface for a length of four or five feet, ending in a point six inches broad. The paddles are of a similar kind to those of neighbouring tribes of lower reaches. They stand erect in their canoes when travelling, and appear to maintain the vertical position with marvellous ease.

A farther ascent of a few miles of the river disclosed a village on the left bank composed of about an equal number of houses to that just described, each about thirty feet in length. The launch anchored about 200 hundred yards from the village, at a place where the width of the river was about 250 yards. The natives, notwithstanding friendly advances, could not be induced to approach the expedition; it was therefore decided to visit the village. In so doing the party was met by a great number of the villagers, who received them with unsuspecting friendship. Some trading was done with them, but no food could be procured. Their numbers appeared greater than at the lower village. The people of these villages, who are not settled agriculturists, apparently subsist chiefly on the products of the hunt and the forest, combined with sago and breadfruit, and by fishing. Their physical aspect was fair, and excepting a few who suffered from ulcers, and more from the common form of ringworm, their condition was generally a healthy one. For domestic purposes they use the plaited basket, net bags, and buckets

made from the cover of the flowering branches of palms; they also manufacture fishing-nets. Their head ornaments and other decorations are to these children of nature articles of very great value, probably handed down from father to son. By reason of its rarity they attach great worth to remnants of the stone adze, and exhibited unusual eagerness to procure tomahawks, although unwilling to part with any of their old head-dresses as articles of exchange.

The maximum temperature during the hottest hours of the day was 90° Fahr., which decreased to 72° at night. A farther ascent of twenty-five miles was accomplished, when the banks of the river were observed to be about thirty feet in height, with a general upward tendency on the immediate margin of the stream, and gradually declining outwards into swampy morbid areas. The river at this time and place was low and obstructed by mud-spits, which impeded the free navigation of its channel. Although the surface of the country is covered with forest, there is nevertheless almost an entire absence of large timber.

Baggia Island was next reached, but, owing to the maximum subsidence of the waters of the river, the channel on its western side was dry, leaving the entire discharge to the eastern side. The flood marks, which could be traced on the top of the highest banks, indicated conditions uncongenial to permanent occupation of the locality even by Papuans. Excepting a few inferior bread-fruit trees and sago-palms, the unattractive forest yielded no food.

The confluence of the Fly and Alice Rivers was next reached, at which place the existence of an island was discovered, which by some strange oversight had apparently been omitted on D'Albertis' map of the Fly River. Even in that explorer's work on "New Guinea," singularly, no description of it is given. Taking these circumstances into consideration, the island was considered a new discovery, and named Morehead Island. It will, however, be observed, upon reference to the *Proceedings* of the Royal Geographical Society of Australasia, New

South Wales and Victorian Branches, vol. i. p. 26, that a map of the Fly River is published by Mr. Law Hargrave from his survey of that stream when accompanying D'Albertis on his expedition, upon which the island in question is shown. A tracing of this map was presented by the author to the Royal Geographical Society of London, and a finished drawing of it was also given to the editor of the *Town and Country Journal*.

The name Snake Point, applied by D'Albertis to the locality at juncture of the Fly and Alice Rivers, was renamed D'Albertis Junction in honour of that accomplished naturalist and explorer, who for so long a time had devoted his means and energy to the cause of science in Papua. From cross-sections taken at a time when both rivers were very low the Fly measured 207 yards in width, 15 feet in average depth, with a current of one and a half miles per hour, discharging 11 thousand millions of gallons of water per twenty-four hours; the Alice measured 152 yards in width, 12 feet in average depth, with a current of two miles per hour, and a discharge of about 8500 millions of gallons in twenty-four hours. The general course of the Alice River was in the direction of north-west, and the meandering of the Fly River towards the north-east. It may therefore be assumed that almost the whole of the basin of the former stream is comprised within the Dutch territory.

Camp was next pitched on a small hill of red clay of about sixty feet in height on the right bank of the Fly River, which the expedition had decided to ascend in preference to the Alice, which did not so materially affect British interests. It now for the first time dawned upon the party that the monotonous and morbid regions had been left behind and undulating country actually reached. Stones were here for the first time met with during the river journey; these consisted of quartz pebbles, sandstone, basalt, and limestone. Here the forest trees assumed larger proportions than those of lower reaches; the wild food was scarce, and birds few. The daily shade temperature was 85° Fahr., and that of the early

morning 74°. The thickly forested country passed through for the succeeding twenty miles presented no indications of permanent occupation. Fastened to the river bank at different places were, however, three canoes, the owners of which were apparently absent in the hunting-field. A present was left in each canoe, but no response was received to friendly calls. These outriggerless canoes, which had evidently been shaped by stone implements, were about fifteen feet in length by twelve inches in breadth, terminating in well-shaped ends. The paddle-blades consisted of pieces of tree-bark inserted into slits in the ends of six-foot shafts made from saplings. In this locality the river receives a tributary on its left bank of about sixty yards in width.

While proceeding up the river on January 13th, the presence of natives was made known by savage yells issuing from the right bank of the river, in response to which the password of friendship from the expedition resounded through the air, which was in time reciprocated by the Papuans. Regarding this interchange of civilities as sufficiently satisfactory, and apprehending no hostility, some of the party proceeded to examine the river gravel at a red point on its left side, where traces of gold were observed, while the remainder were occupied on the top of the bank looking for botanical specimens. While absorbed in these pursuits, made specially interesting through the finding of a very bright ruby or garnet, the party was stealthily approached by the natives, who showered down upon it a number of arrows and afterwards fled to the cover of the forest. One of the members of the expedition named Lario, a Malay, was wounded in the right shoulder, and one of the arrows pierced the protecting boards of the launch, but fortunately no further damage was done. It was intended to inflict punishment for this unprovoked hostility, but local circumstances were unfavourable to this course of action, and a conciliatory policy was adopted instead by again leaving presents in some canoes which at a higher point were tied to the bank of the river. It was, however, considered by some of the

party that these wild natives, probably assigning these acts to other reasons than those intended, would be encouraged to further aggression, but happily such was not the case, notwithstanding the many opportunities offered them during the two weeks occupied by the expedition in their territory. In deference to the wishes of the wounded Malay, who was fully recovered in a week's time, the place of attack was named Lario Bank.

About sixty miles distant, in a north-easterly direction, the Victor Emanuel range was observed from a place on the river above Lario Bank. This range of mountains was first observed and named by D'Albertis. From this neighbourhood the sinuosities of the Fly lay amongst low rounded hills of a few hundred feet in height, composed of red clay and rough sandstone, the whole being clothed by a forest mantle. Small islands occupied the river channel at places, and these were formed of small stones and pebbles which consisted of limestone, quartz, granite, conglomerate, slate, basalt, flint, shells, and petrified coral, of all of which specimens were obtained, including a specimen of petrified palm. In the river, which varies from eighty to three hundred yards in width, a sandstone bar crosses nearly the entire breadth of its bed, leaving a narrow channel close to the right bank sufficiently wide and deep enough for navigation by a steam launch. At a velocity averaging probably not less than four miles per hour, with an increasing declivity, the current consequently became stronger as the expedition advanced. Rapids were also encountered, over some of which it was tedious and difficult to navigate. In the neighbourhood of one of these rapids of about a mile in length there exists an island, of three-fourths of a mile in length by a fourth of a mile in width, covered by old forest. Upon this patch of land surrounded by the waters of the Fly the name of Macrossan Island was bestowed. A few small gardens, within which there grew wild bananas, sweet potatoes, sugar-cane, and taro, were passed on the bank of the river. The high land in this region, although suited for occupation, is of little

use for the purpose of agriculture; and the alluvial deposits on the margin of the watercourse are so circumscribed and impregnated with sand as to render them unfit for heavy crops.

Although no natives had been met with since leaving Lario Bank, the many traces observed of them were a sufficient precautionary warning to the party. Profiting by past experiences, each night's camp was securely fortified by a log fence five feet high, inside of which the sleeping-hammocks were suspended about two feet from the ground from long sticks resting upon the fence, the whole being covered by the tents. This structure was built on the edge of the river, in front of which the steam launch was moored so as to be easy of access in case of emergency. A few miles above Macrossan Island a strong rapid was met with, in the middle of which a shingle-spit was formed. To accomplish its ascent the launch had to disengage itself from the whale-boats and stem the whirling current with full steam pressure. After the successful accomplishment of this task the launch by some oversight was permitted to drag from the deep pool of water at the head of the rapid into the strong current, which swept it on to the shallow bed of the river, where it heeled over and was held fast by some large stones. Fortunately no damage was done by this accident, for after the supplies and firewood had been discharged into the whale-boats the launch was again floated, and succeeded for the second time in reaching the placid waters above the rapid. Upon examination this shingly spit yielded traces of fine gold. Some canoes were seen tied to the bank of the river, but the native owners were not met with. After other rapids had been passed, at one of which indications of gold were again observed, the limit of steam navigation was reached at the commencement of a rapid about a mile and a half long, in latitude about $5^{\circ} 58'$ S., at which place the launch was securely anchored in mid-stream for a period of ten days, while higher levels were being reached by the expedition in the whale-boats. From this point almost the entire watercourse of the river

consisted of successive rapids, over some of which it was difficult to drag even the whale-boat. Some four miles above the place where the launch had been left the river is divided into two branches, which are so nearly equal in size as to make it hard to decide which should be known as the Fly River and which as the affluent. However, after comparisons had been made, the stream trending in the direction of east-north-east was regarded as the branch, and named the Palmer River, in honour of Sir Arthur Palmer of Queensland. In measuring the comparative sections of the two streams the Fly was found to be 130 yards wide, sixteen feet in average depth, the average hourly rate of current three miles, and the volume of water discharged in twenty-four hours about 14,760 millions of gallons; in juxtaposition to this, the width of the Palmer River was 120 yards, its average depth eighteen feet, with a current of two and a half miles per hour, and a discharge of 12,770 millions of gallons per twenty-four hours. To the point of union of these two rivers the name of Palmer Junction was applied. The characteristic features of the Fly and Palmer rivers differ very considerably, the former possessing a broad channel near its junction with the latter, some part of which, being confined to a narrower channel, is deep and sluggish, and better adapted for navigation than its sister stream. Taking into consideration these comparative conditions, it was deemed expedient to follow up the course of the Palmer River, being the one most likely to afford access to higher regions.

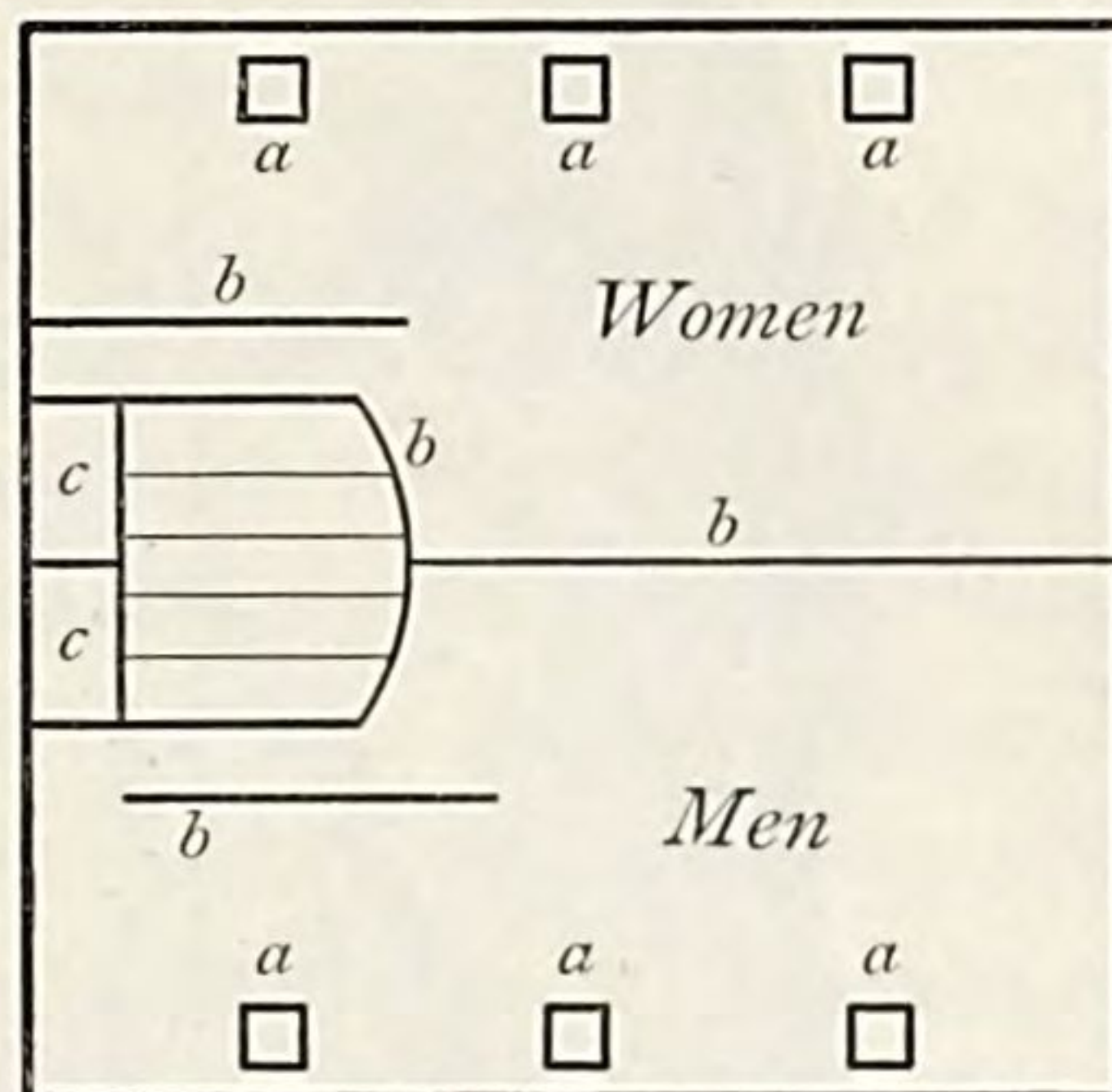
Proceeding onwards, camp was pitched on the left bank of the Palmer about three and a half miles above Palmer Junction. Rain fell at night, which rendered an outdoor camp less comfortable than could have been desired. Notwithstanding this the party enjoyed immunity from sickness. Although in this locality birds were numerous, their condition of moulting rendered them unfit for collecting purposes. Here, as at lower levels, the usual protecting fence was constructed around the camp. For the succeed-

ing ten miles the average width of the river was from 120 yards to 130 yards, with banks from twenty to thirty feet in height; it received on its left a small tributary stream of about forty yards in width. Consisting of low hills not exceeding 300 feet high, the face of the country is covered with forest, the trees of which are similar in character to the varieties met with on the lowlands of British New Guinea generally. On washing some of the river-bed deposits traces of gold were obtained. Three natives were observed ascending the stream in a canoe, which appeared to be similar to those in use on the lower reaches of the river. Although efforts were not wanting to induce friendly intercourse with them, they could not be prevailed upon to approach the expedition. A small present was left in their canoe, which they had tied to the river bank before disappearing under cover of the jungle. The paddles, which had pieces of bark as blades, were similar to those already described. The temperature ranged from 75° Fahr. at 6.30 A.M., and 78° an hour after sunset, to 85° in the shade during the daytime.

Camp was next formed on the left bank of the river some thirty miles from its junction with the Fly. Over several sections of this distance, where the velocity of the current was too great for the use of oars, the boat was dragged by means of a long rope. The river at this camp appeared to be subject to a great rise and fall. Flood-marks on the trees were observed from twenty to twenty-five feet above its ordinary level. The alluvial soil is impregnated with a larger percentage of sand, disintegrated from the neighbouring sandstone hills, than of humus. A seam of lignite six inches in thickness was discovered between layers of sandstone in a section of the right side of the river, at which place its bank is thirty-five feet in height. Fossils of trees were also observed in the face of the strata. The banks of the river were abundantly clad with a long slender cane. By the application of oars and rope-dragging an additional distance of about ten miles was accomplished; over this section the sinuosities of the river were great, and the rapids tedious and

numerous. Here the Palmer River receives a tributary 100 yards in width, which was named the Donaldson River. Sago-palms, bread-fruit trees, and wild bananas grew at several places along the river banks, which were generally below the level of flood-mark. Several small gardens, in which were growing the usual products, were passed on the banks of and islands in the river. Two houses were also seen on the right bank of the Palmer, one of which was built on a red hill, some sixty feet high, that was so steep on its river side as to render access most difficult. Probably over half an acre of ground had been operated on, the trees having been felled by the stone adze. Excepting some bananas, nothing was, however, growing thereon. Considering the natives met with some 180 miles lower appeared to know nothing of the use of tobacco, surprise was felt at the discovery of several tobacco plants growing under the house in question. This house, the roof of which was made of the leaves of the palm sewn together in layers on small saplings, was twenty feet square. It stood on piles about twelve feet high, several of which were tree stumps grown there; its internal shape resembled that of a whale-boat upside down; crossing upright saplings, a cane ladder afforded entrance through a narrow space in the floor at one end of the house, which had two floors about eighteen inches apart, both of which were composed of split bamboo and palm rind mixed, and were laid on saplings that rested on the posts below; on the upper floor the entrance was divided into two. Six openings, two and a half feet square, were cut in the upper floor, opposite which on the upper surface of the lower floor were patches of mud and clay which served as fireplaces. Closely fitted split saplings were used for the walls of the house, which were six or seven feet high and in places lined with the rind of the palm. Four loopholes were arranged in front, and three at each end, about half-way up the wall. The back chamber, which from certain indications had been occupied apparently by women, had no loopholes in the wall. The entrance through the floor, which was partially closed on

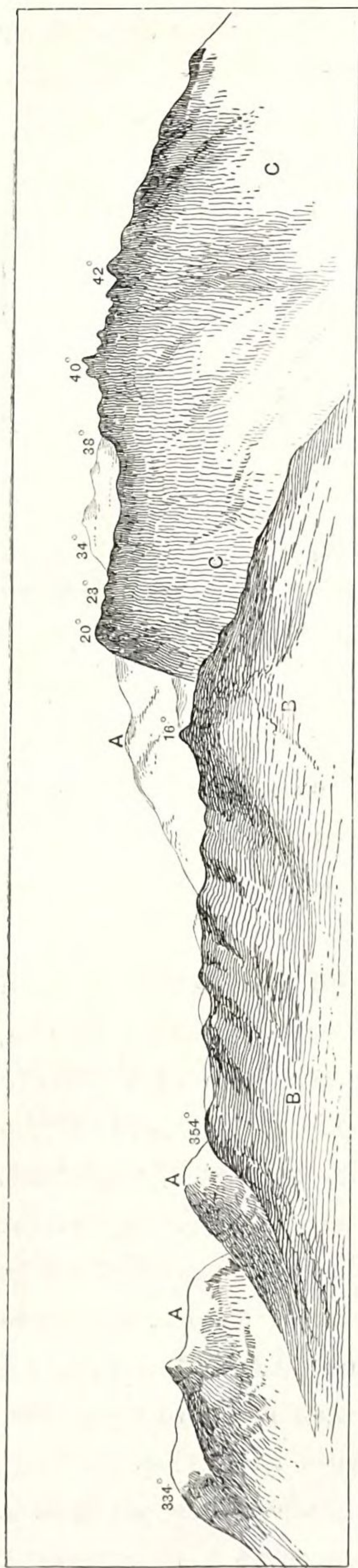
the inner side by strong cane attached to saplings, was about four and a half feet square. This covering was so placed as to be easily removed when necessary. The house was divided by a central partition of the rind of palm, which was joined to a semicircular division some six feet in height at the inner side of the entrance. On each side was a six-feet high division, the one in the women's compartment abutting on the wall, and that in the men's quarters being separated from the side of the house by a space of about a foot. The subjoined illustration will more closely show the ground-plan of the house in question. The house was to all intents



a. Fireplace ; *b.* Partition or screen ; *c.* Entrance.

and purposes invincible to the bow and arrow. The usual household goods and chattels peculiar to the race were found inside this interesting dwelling. From this place on the upward journey several native gardens were passed, but no additional signs of life were visible.

A fine view of the Victor Emanuel range was obtained from near the confluence of the Palmer and a new tributary stream, upon which the name of Black River was bestowed as a tribute to the name of the Minister for Public Lands, Queensland. This branch, which united with the Palmer on its left bank, was about seventy yards in breadth, and contained a large volume of water. Above the junction of the Black River the channel of the Palmer is so obstructed by limestone rocks and numerous snags that the navigation of its waters by boat can only be accomplished with great difficulty. At a place where the river bank was over twenty feet in height the usual defence palisade was constructed and camp pitched ; the provisions were also stowed within this enclosure, as it was considered inexpedient to attempt their transport to higher regions.



a. Victor Emanuel Range, highest point 12,000 ft.; *b.* Mount Donaldson, highest point 2000 ft.;
c. Mount Blücher, highest point 5000 ft.

In this neighbourhood the visible country which was free from grass consisted chiefly of low hills which did not exceed 100 feet in height. These were covered by trees of very uneven size, and by reeds. The river bed was prospected, and yielded traces of fine gold. Heavy thunder-showers generally occurred at night, which rapidly augmented the river waters so as to further increase the dangers of navigation.

The camp was left in charge of two Polynesians and one Papuan, and the remainder of the party, being seven in number, proceeded on the upward journey. When about nine miles above the camp in question the expedition obtained a very good view of the highlands of the interior. Situated at a distance varying from thirty-five to forty-five miles from the point of observation, the more remote, the Victor Emanuel range, presented an appearance of the wildest description. It appeared inaccessible from its southern aspect, and its lofty north-east peaks, which showed enormous escarpments of bare rock with ravines almost void of vegetation, seemed extremely rugged and precipitous. The highest points of this great range, which were destitute of forest, appeared to attain an altitude of over 12,000 feet. Well clothed by

forest on its south-west section, the northern part was covered only on its lower half. The location of this range, which maintained a general easterly and westerly trend, appeared to be within the German Possession. At a distance of probably ten miles a range of mountains was seen, probably twenty-five miles long and about 1500 to 2000 feet in height, with its summit covered by forest. To this range, which appeared narrow, and to be within British territory, the name of Mount Donaldson was given. Located between the north-eastern end of Mount Donaldson and the Victor Emanuel range the precipitous western end of a range was seen, probably fifty miles in length, and about 5000 to 6000 feet above the level of the sea. The highest part at least of this range was evidently within the German Possession, and for that reason the German name of Blücher was bestowed upon it. The summit of Mount Blücher is forest-clad, and its southern slopes, which were precipitous, seemed, as viewed from a distance of about twenty-five miles, to be subject to land-slips; the outlines of some of these, which were of enormous dimensions, were distinctly traceable from the place of observation. The southern aspect of this great mountain chain appeared to present enormous obstacles to its ascent, but the features of its eastern section were more inviting to the venturesome mountaineer, who would apparently experience no great difficulty in attaining to its highest zone. It appeared to possess a central spur, which trended in a north-easterly direction, towards which it also increased in altitude. No connection, however, between it and the Victor Emanuel range could be established at so great a distance as that from which the observations were made.

Proceeding about six miles farther up the river, to a point the approximate position of which was found to be about $5^{\circ} 31'$ S. latitude, a claystone bar across the bed of the river was encountered. The water over this was then so shallow that the whale-boat could not be navigated across with safety, which circumstance compelled the abandonment of the water channel of the river as a means of

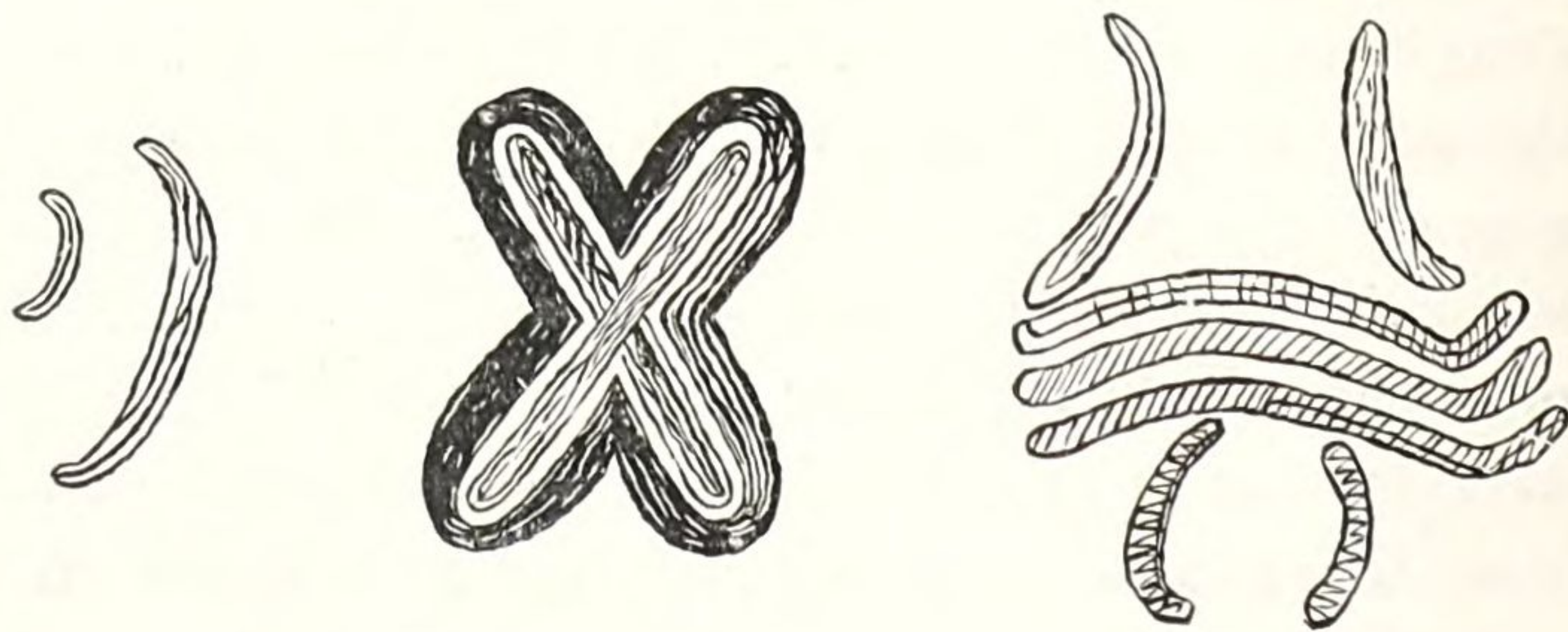
reaching farther into the interior. A camp was therefore formed at this place, and an attempt made to reach the Donaldson range, which was only about six miles off, by a march across country. When about two miles above camp the voices of people were heard, and shortly, on approaching the river bank, a man and a boy were seen about half-way over, fording the river. Pacific signals and shouts were directed towards them, but to these they did not respond. The boy, who carried a bow and arrows, wore a girdle, and the man, who was also similarly covered by a girdle made of grass, wore his hair, which was plaited with fibre into long pigtails, hanging down his back. He also was armed with the bow and arrow, and carried on his back a netted bag and dead wallaby. The most remarkable feature in the lot was a fine specimen of the orange-coloured dingo perched monkey-fashion on top of the bag, where he appeared to sit at ease during the progress of the fording of the river; when dry land was reached he gracefully sprang to the ground. Excepting their somewhat "remarkably light bronze colour," these people were in no manner different from other known tribes of the British Possession. After fording the river, which was about 100 yards in width, these two natives disarmed and returned to the edge of the water, making signs to the expedition to proceed up the river; but nothing was made of the language they spoke, which was altogether different from other dialects with which the expedition was familiar. Efforts were not wanting to entice these people to approach the party to receive a present, but although in other respects friendly and unsuspicious, they could not be induced to closer intercourse.

When a point had been reached about five miles from camp, the day was far advanced; and, as there was still some distance to the foot of the mountains, it was not deemed prudent to proceed farther, more especially as provision had not been made for camping away from the boat, and as the near approach of rain was apparent. On the return journey to camp their voices

and other indications betokened the presence of natives at no great distance, but friendly calls and gesticulations could not induce these pacific Papuans to meet their fair-skinned brethren. With banks of from ten to twenty feet high, the river channel, which was broad, appeared out of proportion to its ordinary volume. This country, which is all clothed with forest mantle, possesses large areas suitable for cultivation, but the extent of land occupied by the native inhabitants was not ascertained. The natives met with appeared quiet and inoffensive. This may be readily inferred from the significant fact that, notwithstanding the division of the expedition into sections separated by many miles, no hostile demonstrations were exhibited. The whale-boat was reached, and, as an exploration of the mountainous regions could not then be effected, preparations for the return journey were made. Before leaving, a tree was selected and marked by a broad-arrow over the letters B.N.G. On the morning of the 24th January 1890 the descent of the river was commenced, and after halting at the intermediate camp to embark stores, the steam launch was reached in safety by 6 P.M. of the same day. Taking advantage of a rise in the river waters, the launch was quickly got ready, and the downward course proceeded with on the following day. Excepting a slight mishap to the engine of the launch, no serious obstacles were met with, and on February 2 the expedition safely arrived at the village of Kiwai, after an absence of a little over five weeks.

The exploration of the Fly River, so successfully conducted by his honour the Administrator of the Government of British New Guinea, has resulted in an additional elucidation of the geographical conditions of the highlands in the neighbourhood of the international boundary, and of the basin of the great watercourse. From the materials obtained we are at once enabled to arrive at some useful conclusions, especially regarding the ethnography and ethnology of the native inhabitants, in the welfare of whom we have so great an interest. From the former department we learn that,

while the tribes inhabiting the lower deltaic zones of the river are apparently settled agricultural people, those of its middle and upper regions are characterised by their nomadic tendencies. From the latter conditions we conclude that no marked physical distinctions exist between the coastal tribes and those of the highland zones. The bow and arrow are common to all, the only difference being in shade of colour and in language, that spoken on the upper Fly being different in probably every word to the coastal dialects. Excepting some cedar, together with other woods of value that may probably be discovered in its forests, and the existence of gold deposits in the bed of the river, the commercial aspects of the country are not by any means inviting; nor can we pronounce more favourably upon its climatic phases.



FIGURES CARVED ON A TREE BY NATIVES, MIDDLE FLY RIVER.

CHAPTER X.

WEST FROM THE FLY TO THE ANGLO-DUTCH BOUNDARY

“The soil exhaling clouds of subtile dews,
Imbibing moisture which with ease she spews.”—DRYDEN’S *Virgil*.

THIS chapter will deal with the geographical conditions of the southwestern territory of the British Possession fringing the seashore, and contained between the embouchure of the Fly River and the Anglo-Dutch boundary, along the 141st meridian of east longitude. The physical conditions of this section of coast line are chiefly characterised by their unattractiveness, rendered so by the lowness of the shores and the paucity of human inhabitants, the former affording no scenic effect, and the latter infusing no vitality, so that the general aspect is one of gloomy solitude, broken only at times by the timid voice of the almost extirpated native wanderers still spared by the tyrannous cannibals, who for years have terrorised the whole of the inhabitants of these western confines.

The country bordering upon the shores is low and swampy, and the approaches thereto are impeded by an almost unbroken continuity of mud-flats of great magnitude, which are skirted by almost impenetrable belts of mangroves. These morbidic areas are intersected by numerous tidal channels, through which the waters of the ocean swell and recede in their diurnal movements, affording access to inland regions which, but for their presence, could not be reached without laborious cutting through dense forest and jungle, and the crossing of extensive areas of swamps. The only knowledge we have been able to acquire concerning this hitherto almost entirely unknown

part of the Papuan territory is fragmentary, of a hypothetical character, and not based upon actual exploration.

In opposition to these statements it may be advanced that the navigation of several deltaic channels which divide and encompass large areas of the low-lying shores has furnished us with many data by which a fair itinerary delineation of the general aspects of the country may be made; but yet it must be borne in mind that previous observations were chiefly confined to a comparatively circumscribed territorial area skirting the shore, and outside of which nothing was positively known. These channels were usually navigated in sailing craft by the aid of wind and tide, and, when at all practicable, landings on shore were not sufficiently long to permit of a thorough examination of the geographical conditions of the region. It was here, chiefly in the neighbourhood of the Mai Kussa and Wasi Kussa rivers, that the *Herald* party sought to establish itself; here Captain Strachan circumnavigated the deltaic area to which his own name is applied, and indicated the existence of numerous tributary streams.

The results of Captain Strachan's peregrinations were deliberated upon at a meeting of the Royal Geographical Society of Australasia, Queensland Branch, in 1886, at which time the writer of these pages pointed out that the watercourses designated rivers by the *Herald* party would most probably be identified as arms of the sea, having no definite interior sources, but simply terminating in swamps or lagoons in the immediate neighbourhood of the seashore. These views, based purely upon practical experience in other similar parts, have subsequently been confirmed by the recent observations made by Sir William MacGregor's party.

As referred to in a previous chapter, the tidal water channels circulating through the eastern section of this western territory may probably have some connection with the waters of the Fly, in which case the intersected areas will simply form part of the deltaic system of that great watercourse. Even now there are published maps

showing the union of the Mai Kussa with the Fly channel. These delineations cannot, however, as yet be regarded otherwise than as merely hypothetical. It may, nevertheless, be assumed with the strongest probabilities of certitude that, owing to the general north-westerly trend of the lower Fly, by which condition the territory bounded by its right bank and the seashore is limited to the extent of about seventy or eighty miles, no independent river of any considerable magnitude can exist. Hence, as the corollary of our theory, it obviously follows that the watercourses disemboguing into the sea in this part are merely minor and probably tributary streams, some of which flow round extensive, low-lying mangrove areas that are in places designated islands. Some of these channels, especially those to which Talbot Island is adjacent, are deep and navigable for coastal vessels of about fifty tons, as demonstrated by Captain Strachan, who sailed through them in the schooner *Herald*.

Of the ethnography of the people who once inhabited this region we know nothing useful. It is, however, affirmed that the natural and artificial resources of the district were sufficient to support a very considerable population of natives, who are now almost entirely extirpated by the incursions of a powerful band of insidious anthropophagi rejoicing in the name of Tugere, the very utterance of which in the presence of these wretched remnant tribes excites terror. For some years past thrilling accounts of the operations of the Tugere tribe have reached the haunts of civilisation. The members of this tribe, it is now known, are nomadic; they scour the whole face of the country in quest of their human prey, their line of motion being from west to east periodically, as the conditions of the seasons favour locomotion. Moving along, sometimes noiselessly and stealthily, they fall upon their prey, carrying off women, children, and men indiscriminately. These raids have been so successfully conducted that the entire population of this region has been almost annihilated. They are people of powerful physique, bold, insolently daring, and would not hesitate to direct an attack upon a European party if the results

were at all likely to be in their favour. A practical demonstration of this was witnessed by Captain Strachan, whose comrades had to abandon their vessel and defend their lives against these powerful, warlike savages.

If we permit the indulgence of our speculative faculties for a moment, and glance at the assumed social condition of the inhabitants of this region during past ages, we shall be able to conceive a spectacle of the wildest horror. Here we have a section of isolated territory inhabited by tribal communities who, although probably at enmity the one division with the other, are individually living in family peace, warmed by the heat of domestic affection, when, without the slightest warning, the whole horizon is overcast and the village atmosphere contaminated by what may rightly be termed the Tugere plague. Stealthily creeping upon them from the westward, these insidious pirates fall upon groups of women and children, brutally outrage, kill, and carry them off, while the male members of the community likewise fall victims. Imagine the loathsomeness of this ogreish scene; picture the aspect of desolation in one of these native villages after the destroying blast has passed away—the agony of the wounded, the wailing of the widow, and the pitiable crying of the orphan. These are dramas in the social life of Papuan tribes to which, fortunately, our civilised communities can furnish no parallel, nor yet of which can the modern mind form the faintest adequate conception.

These remnants of what were formerly powerful tribes are perforce itinerants, wandering over the face of the cheerless country in constant fear. Some of them were met by Captain Strachan, who describes them in favourable terms. He found them timid and not easily persuaded to intercourse; their colour was very dark, they showed good physical form and considerable activity. Their plantations were, at the time of his visit, carefully cultivated and fenced, from which, and other indications, it was concluded that their services in tropical agriculture would be valuable.¹

¹ *Proc. and Trans. R.G.S.A. (Queensland Branch)*, vol. i.

In consideration of the wretched state in which these fragments of a people have for so long existed, it is to be desired that efforts to ameliorate their condition will characterise future European operations in this part of the British Possession; even the desire to investigate their ethnography by preserving the remainder ought to be sufficient incentive for action in the direction indicated, whether on the part of Government or of private enterprise.

Sir William MacGregor conducted a party upon a tour of inspection from the Fly River to the western boundary of this territory during the months of February and March 1890.

Yaru Island, which is situated a few miles west of the mouth of the Fly, is much frequented by fishermen, who are chiefly occupied in collecting pearl-shell and trepang. The place shows signs of some activity, caused most probably by contact with fishermen from other parts, to whom the inhabitants of the locality supply wood, water, and food in return for fair remuneration.

The Oriomo River, formerly known as the Tait River, is a comparatively small stream, maintaining a width of about 200 yards for a few miles from its embouchure, then it decreases to about 80 yards, and at 40 miles it radiates into numerous creeks of no consequence. The lower section of this river possesses the usual characteristics of the watercourses in this region; swampy areas of low mangrove land border upon its channel, which, as the distance from the seashore increases, give place to slightly elevated sections, upon which some representatives of the cocoanut palm are met with. The surface features are clothed by cedar, eucalypti, and other forest varieties of less importance. The head waters of the river are surrounded by features of somewhat more remarkable prominence; the banks, which are composed chiefly of red clay, are higher, and the general conformation of the country is undulating and grassy. The soil, however, is of the poorest quality, and unsuited for the purposes of cultivation in its virgin state. This could, however, most probably be improved by a system of drainage to

carry off the water and dislodge the sourness from the soil. The low swampy conditions of the locality render this portion of country unfit for habitation; the sago and mangrove swampy areas are inimical to human life, and the exudations with which the atmosphere both day and night is contaminated render a prolonged sojourn both distasteful and dangerous. The wandering people who move about the left bank of the river are designated Dariamo, and those on the country bordering upon the right bank are known by the name of Keruriamo; these are but remnants of bygone populations.

The village of Kunini, now occupied by a tribe who at one time inhabited a village of the same name in the dark recesses of the forest, is situated upon the sea-beach, westward from the Oriomo River. The people, who style themselves children of the bush, were not unfriendly, notwithstanding the significant fact that bows and great bundles of arrows were at hand ready for immediate action upon the slightest provocation. They evinced a desire to enter into commercial relations in the exchange of their food for value in tobacco. The comical phases of their natures were exhibited chiefly by their affected familiarity with the English language and their appreciation of European articles of clothing, from rag scraps to whole garments. Their necks were ornamented by cords of plaited fibre, and the skin of their bodies was bedaubed with yellow-coloured clay. The graves, which were in undesirable proximity to the houses, consisted of small houses, probably five feet in height, constructed over the corpses, which are apparently interred under a mound of earth some eighteen inches above the surface of the ground. In burying their dead it is apparently the custom to place upon the graves of the males their weapons of war, and upon those of the females the implements most frequently used by them, together with two or probably more cocoanuts, into which are usually stuck pieces of palm-leaf cut into such form and placed in such position as will most effectually represent the feathers of the paradise bird. Platforms are erected near the graves, upon which a supply of food is deposited,

no doubt intended to satisfy the hungry soul of the departed or to appease the evil spirits by which the lives of these wretched people are haunted and kept in constant fear and subjection. In this respect they are, sad to relate, nothing inferior to the inhabitants of many other parts of the world, both white and black. Still it is to be feared that, until such time as they are removed from the evils of their social environment, no great improvement in their present condition can be hoped for. They are, like our forefathers, slaves to superstition and witchcraft. Kunini contains about 250 inhabitants, who may in time improve by their removal from the sombre associations of the forest to the seashore, where the ozone of the ocean, the change of food, and the soothing murmuring of the waters will infuse fresh inspirations and renew vitality.

The villages of Tureture, Mouatba, and Kadáwa are situated in this locality, bordering upon the Binaturi River, being separated from one another by very short distances only. Excepting the former, these villages are very dirty, and the dwelling-houses in such bad repair as to be unfit for human habitation. Gamea and Gabia are rival chiefs, who live each in the two last-named villages. It is probably owing to this rivalry, and to the absence of some of the younger members of the community, who are periodically away from their homes working for Europeans, that the houses are so neglected. Owing, no doubt, to their frequent intercourse with traders and with fishermen, they are enabled to affect articles of European clothing, which they love to display on every favourable opportunity; nor are they contented with European manufactured articles, but they must needs persist in conversing in the English tongue. The disjointed phrases are, however, of slang origin.

The Binaturi River, or, more appropriately, creek, is a water channel of no great importance. About eighty yards in width at the mouth, it rapidly decreases to twenty yards at about eight miles from the seashore, where it is broken up into two branches, both of which are too narrow for navigation by steam. The

eastern branch is known by the name of Goua Kunini, and that of the western Goua. The land on the margin of this river is low and swampy, being almost on a level with high-water, and in some places actually below the surface of the tidal waters. Small groves of the cocoanut palm and one or two gardens relieve the monotony of the unattractive surroundings; the gardens are planted with sweet potatoes, yams, taro, and bananas, which, being out of the influence of the tidal waters, flourish. The slightly elevated land bounded by the two creeks aforesaid is occupied by the village of Goua, the inhabitants of which are friendly disposed to strangers, although constantly moving about under arms; the majority of these villagers appeared to be young men who were anxious to barter food for equal value of tobacco.

In this neighbourhood the Kawa Kussa River disembogues into the ocean about half a mile east of the hill known by the name of Mabudauan, which is the only prominent elevation on the coast of this region. The mouth of the river, which is distinguished by the existence of two islands, called respectively Malukawa and Sapural-kawa, is located in a large area of mangroves, surrounded and occupied by extensive swamps, so that the public highway lies chiefly through morasses, which render access most difficult and tedious to the uninitiated. These areas are mostly below high-water mark, are destitute of attractiveness, the only points of interest being small patches of bamboo and a variety of "paper-bark" tree.

The hill of Mabudauan, which is about 200 feet high, of granite formation, and clothed by trees and cocoanut palm groves, offers facilities for the establishment of a Government station, to be occupied by a resident magistrate. There is plenty of fresh water, and some suitable planting land, while the water in the entrance channel of the river is about three fathoms in depth, with good shelter for craft during the monsoons. The physical aspects of the locality give promise of immunity from malarial disorders, a matter of very great

importance to be considered when selecting a residential site in tropical climates. One of the camps, which had lately been occupied by the Tugere tribe, was met with on the lower reaches of the Kawa Kussa River, where part of the previous year's operations of these warlike people had been conducted. The expedition of Sir William MacGregor found the people of these parts in a state of great fear at the approaching visit of their western enemies. Taking advantage of the season of prevailing north-west winds, these pirates sweep down along the coast in large outriggerless canoes, returning during the season in which the opposite wind obtains. Some of the inhabitants withdraw from their villages and live in the fastnesses of the forest during the progress through their territory of this western plague; but notwithstanding this precaution, some of their number frequently fall before the foe.

It was found that the dialect spoken by the Kiwai islanders extends in general use, with unimportant variations, as far westward as the island of Saibai, and for a distance of probably over a hundred miles up the Fly River. The importance, therefore, of an acquaintance with that tongue, by those who may in future be associated with this region, cannot be over-estimated, more especially as intercourse with the native inhabitants will necessarily be associated with further investigations into the natural conditions of the region and with commercial enterprises.

The Mai Kussa, which is simply an estuary of the sea, is probably a mile in width, extending for about thirty miles from the seashore, where it is joined by the Wasi Kussa, being a channel of similar size and character. These two tidal watercourses, together with the Yarro Kussa, which unites with the former at a point about five miles from its mouth, and others, constitute an almost labyrinthine system of deltaic channels, upon which were bestowed many names of European origin by Captain Strachan when exploring in the regions of what was then known as the "Prince Leopold" and "Mai Kussa" Rivers, but which now for the first time are designated by

their proper native appellations by Sir William MacGregor. The rocks, of which a few specimens may be seen cropping out along the banks of the watercourses, are of a clayey character, impregnated with iron.

Mangroves fringing the coast, and forest trees of many varieties in more inland areas, clothe the whole surface of this monotonous region; chiefly raw and sour by reason of its swampy character, bordering upon salt water channels, the soil is not apparently suited for European agricultural purposes, nor are there any special or attractive features within the district to induce settlement or enterprises likely to be remunerative. Timbers of economic value are scarce, and natural products almost entirely absent. These unfavourable aspects, combined with bad climate, constrain us to record in this instance, as in the case of the lower Fly River, a verdict against settlement by Europeans. The camps periodically occupied by the Tugere people are located on the margins of the watercourses, usually on clayey ridges, where the best available commanding views are obtained.

From the delta of the Mai Kussa to within seventy or eighty miles of the 141st meridian no native inhabitants nor centres of population were seen. The intervening country maintains the flat, uninteresting character peculiar to this western division, with its predominating feature of mangrove extending over large areas of coast line, while a foreshore of several miles in width is left dry daily by the receding tide. These extensive areas, which are composed chiefly of coral, sand, and mud, are tangible obstacles to the navigation of the circumjacent waters, which are usually impregnated with deposits of soil, and not in any degree protected from the fury and capriciousness of the wind.

The section of country for some extent west of this district assumes a somewhat varying character in its physical aspect. There the extensive foreshore is altogether absent, and even at low-water boats may approach within a yard or two of the beach, upon which the coral superstructure is hidden by a layer of white sand. The

light brown surface stratum of soil with which the coast is fringed terminates in a perpendicular face along this beach, back from which the land appeared to be level and covered by grass, scrub, and deposits of iron ore, with trees of large dimensions growing upon or near the margins of watercourses.

The value of this tract of country lies chiefly in its facilities for grazing purposes, which, if fully developed, might be somewhat considerable. From this place to the Anglo-Dutch boundary no prominent feature is met with coastwise. Mangrove, jungle, and extensive low-lying swampy land are the prevailing characteristics throughout, with small patches of cocoanut groves, which probably mark the sites of human habitations in days gone past. Upon two slight indentations, which gave to the general trend of the coast line an almost imperceptible wavy appearance, Sir William MacGregor bestowed the names of Thomson Bay, after Mr. B. H. Thomson, who was his honour's first private secretary, and Heath Bay, the more westerly of the two, after Captain Heath, ex-Postmaster of Queensland. In the latter bay it was observed that at low-water the extent of foreshore left exposed was no less than about ten miles in width. A river of some importance discharges its waters into Heath Bay, the only watercourse of any noticeable magnitude between the 141st meridian and the Wasi Kussa. This river, which is about 150 to 200 yards in breadth, and probably five fathoms deep at its entrance, discharges a stream of quite fresh water; that along the lower reaches maintains a rate of about three miles per hour. The general physical character of the region through which it flows over the coastal section of its course is of the usual swampy, monotonous order, clothed by dense forest, mangroves, and other varieties of vegetation, upon which the eye is constrained to rest in the absence of the physical features of an attractive landscape. This, combined with the absence of human life, imparts to the surroundings an inhospitable and gloomy appearance, which has a tendency to depress the pioneering enterpriser and to retard settlement.

The intermediate section of this river is chiefly a series of lagoons and swamps, the surface of which are clothed by grass, reeds, and isolated patches of eucalypti, and so great in extent that in navigating its channel no traces of river bank could be found, the whole being one extensive grass-clad surface; the river current here is sluggish, and the waters about seven fathoms in depth. The swamps and lagoons are occupied by large flocks of wild geese, and the channel of the river is the haunt of the catfish and crocodile. In this swampy region some natives were seen and heard, but no available means could induce them to friendly intercourse, nor even to approach close enough to interchange courtesies, notwithstanding the pacific demonstrations of the British New Guinea Government. Some of their canoes were met with, being fastened to the reeds in the river while the owners were engaged most probably in the hunting-field. These canoes, which measured about twenty feet in length, eighteen inches in breadth, and probably fifteen inches in depth, possessed no outriggers. They had been constructed of a hard dark wood dug out by the stone adze; their ends, which bore no ornamentations of any kind, were alike in shape. Paddles are not used as the motive power, the method of propulsion being by means of poles, which at times, and under certain conditions, may serve as paddles. On a patch of dry land some neatly cultivated gardens were met with, in which were growing two varieties of sugar-cane, the one pink and the other yellow, and patches of taro. The soil consists of a darkish clay and humus, probably two feet in depth, resting upon a stratum of clay. The characteristic feature of this region lies chiefly in the conformation of the surface of the dry ground, which usually slopes from the edge of watercourses and from the seashore to paper bark and fir-tree swamps; the vegetation includes varieties of stunted eucalypti and small screw palms. This river, the embouchure of which is approximately in longitude $141^{\circ} 30'$ E., latitude $9^{\circ} 15'$ S., maintains a general north by easterly trend, and at a place distant about 100 miles from its mouth it is joined by a

tributary of probably sixty yards in width, which, flowing from the direction of north-west, unites with the main watercourse on its right bank; from this point the river for the succeeding twenty miles upwards is divided into several branches, which meander through a more elevated and consequently a drier tract of country than that met with on its lower section. In longitude $141^{\circ} 38'$ E., latitude $80^{\circ} 33'$ S., 120 miles from its mouth, the river is thirty yards in width and three fathoms in depth. The country is more inviting and much better suited for occupation by the human family than any previously passed through in the river basin.

Although their villages were not seen along the river, several detachments of the native inhabitants of this region were met with. Some of these were unfavourable to intercourse, notwithstanding the earnest and patient pacific demonstrations of the Europeans, while others, after repeated assurances of friendly intentions, were inspired with confidence sufficient to enter into commercial relationship with their official visitors. It was noticed that they moved about in canoes without outriggers, which they propelled by means of long poles that were used as paddles in deep water and for poling purposes in the shallows, both being similar in every respect to those we have previously described as being met with on the lower reaches of this river. The natives were interesting. They are bronze in colour, and wore some peculiar ornaments. Their weapons consist of the bow and arrow and stone club, the former being of great length and strength, made from the bamboo. Their hair is usually worn short; but sometimes this general custom appears to be slightly departed from by some individuals who have their locks sufficiently long to be plaited. They wore necklaces ornamented by wallaby and dog teeth; and similar cross-belts and girdles.

These peoples, who were met with in small tribal detachments, were apparently remnants of larger organisations which had fallen under the scourge of the Tugere. They were, doubtless by reason of being frequently intimidated by the persistent raids of that

band of pirates, shy, distrustful, and greatly agitated, but, nevertheless, their demonstrations were friendly and not apparently treacherous. Their language, which differed entirely from that spoken to the eastward, was not understood, and communication was necessarily conducted by signs, some of which implied that their enemies of the western division were cannibals as well as pirates. It is very probable that two of the tribes met with on this river will, if properly treated, be friendly to the European cause in this part of the British territory.

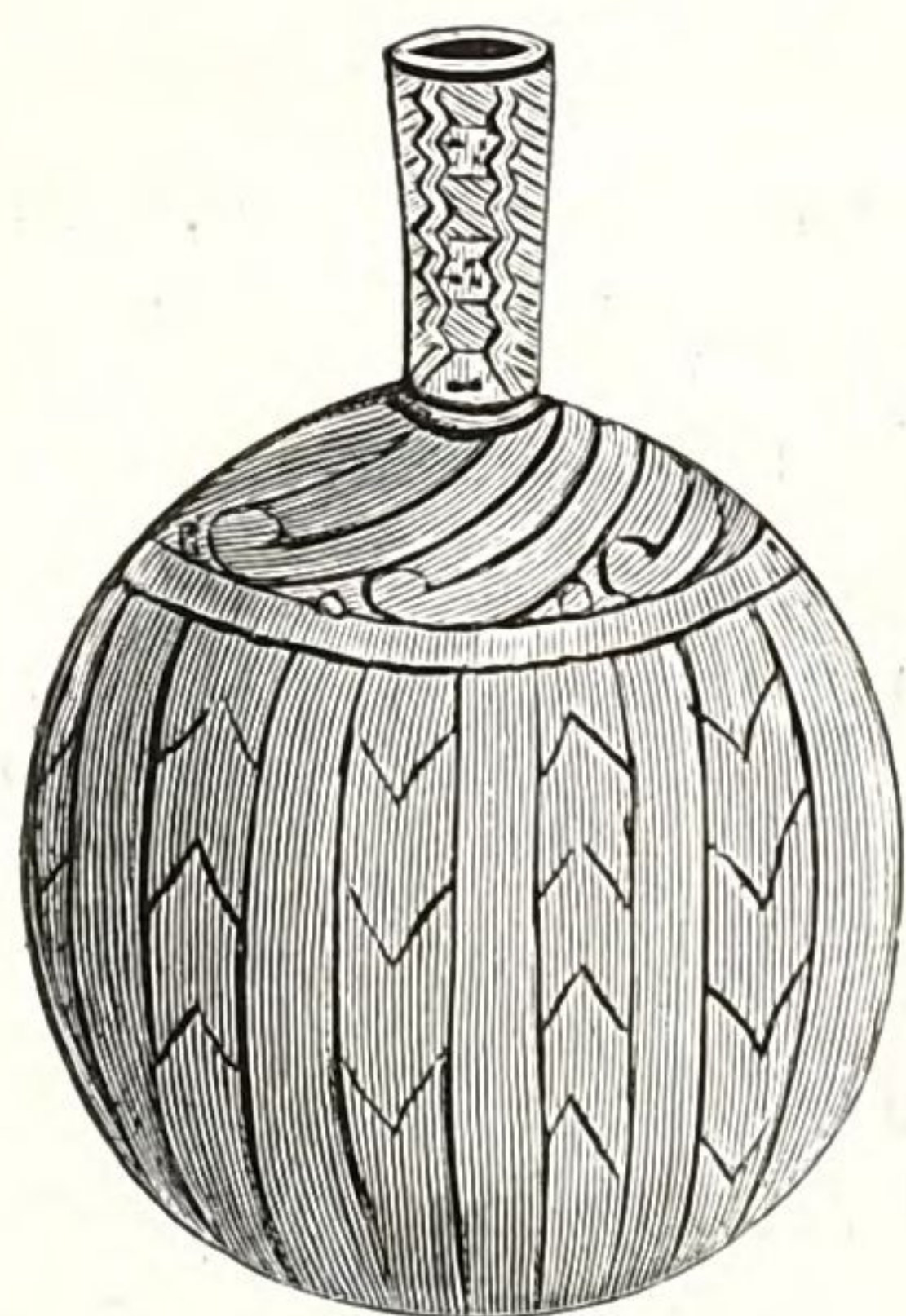
At the time of Sir William MacGregor's visit to this part of the country, it was not clearly shown whether this river was actually a new discovery or identical with that shown in the map published in Captain Strachan's book entitled "Adventures and Explorations in New Guinea." Upon one point we are, however, satisfied—that the position assigned to it by Captain Strachan does not coincide with that determined by Sir William. Whether the difference arises from instrumental errors used in observations, from an omission on the part of the observer, from faulty calculations, or from too great liberality in estimation, or the two rivers actually are distinct the one from the other, we are not prepared to assert with any degree of authority in the absence of more satisfactory data.¹

The Tugere tribe, which was met with within the Dutch territory, comprised a number of men of singularly robust appearance, probably equal to any other known tribe in the Possession. Numbers of them are light-brown in colour, with hazel eyes; their foreheads are prominent and well formed, and their heads covered by frizzly hair plaited into small long pendants, the lower ends of which are formed into small balls, which hang down upon the neck of the wearer in such a position and manner as to apparently impede the movements of the head. The ears are pierced, and profusely ornamented by large rings made of the wire-feathers of the cassowary

¹ As subsequent investigation failed to identify it with that shown in Captain Strachan's book, this watercourse has been named the Morehead River.

wing; the nose is also pierced and ornamented by pieces of bamboo placed into such position as to maintain the vertical. They do not, however, limit their choice for decorative purposes to the forest bamboo, but under certain circumstances the leg-bones of the porker are introduced by way of variety; when these are resorted to, the grotesque appearance of the savage wearer is greatly increased. The ornamentations of the neck were also of considerable interest; these, we may say, consisted of a variety of graceful jewels of a new order, in which pig-tails, parts of human beings dried and tanned, and strings of the teeth of the wallaby were called into requisition. The trophies of human parts were most probably obtained by head-hunting. The breast was decorated by cross-belts of fibre, and so forth; and the waist was encircled by two girdles, one of which was fastened by means of a shell button. They also developed the gorgeousness of their heathenish regalia by additions to their arms and legs of rings of plaited cane or matwork. No tattooing inscriptions nor special skin marks were observed upon these people. As a form of bugle they wore, suspended from the neck, a small cocoanut, the end of which was opened, and additional perforations made in the sides. Their baskets, which are used for carrying sundry articles; are made of a kind of matwork, the net bag not being used by these people for that purpose. Their form of salutation is of some interest even to the non-scientist; approaching one another, they gravely offer their friendly welcome by touching the navel. Plumes of the cassowary adorn their bow gauntlets, the bow and arrow being their tribal weapon. The food they use when travelling upon their marauding voyages consists of arrowroot pounded into masses, which are encased in small baskets made from the leaf of the cocoanut; besides a few straggling cocoanuts and inferior bananas, no food was seen amongst them. They exhibited indications of great eagerness to exchange their property for knives, plane-irons, and other commodities of European manufacture. Finding their available commercial resources almost

exhausted, they had recourse to what doubtless would appear to them a perfectly legitimate transaction—that of offering their



CALABASH FOR LIME USED IN
BETEL NUT CHEWING.

women as a medium for the obtaining of goods and chattels. Finding, much to their astonishment, that overtures of this kind could not be countenanced by the Government of a British Possession, they deliberated upon current events. This tribal council of war, which was conducted in the darkness of the night, could not be watched by the European party, which was at anchor some distance from the shore; but it was surmised that the proceedings, which were loud and noisy, were taken part in by both sexes. The subject of debate could not, of course, be

correctly known, but it was assumed that probably they were discussing the expediency of an attack upon the expedition, or the practicability of again offering their women. The apparent result of this conference was the approach of several fully-manned canoes about 11 P.M., which were met by the two boats prepared to repel their advances. This had the effect of causing them to retreat to the shore, and of restraining them from further acts of aggression. Their inordinate desire for trading was not, however, satisfied, as at break of day they approached the steam launch in a canoe, subsequently retiring to the shore, and returning with four women, whom they were anxious to exchange for iron. These women, who had no ornamentations saving the small curls into which their hair was plaited, wore only a thick fibrous bandage fastened behind



CHUNAM STICK FOR
CONVEYING LIME
TO THE MOUTH
IN BETEL NUT
CHEWING.

and in front to a girdle. They were occupied in chewing betel nut.

These Tugere had evidently been preparing for their annual voyage to the eastward, and arrangements were made to warn them against their undertaking, and against their lawlessness; but finding—much to the surprise and disappointment of all—that the position of their camp was inside the boundary of Dutch territory, the party had to return eastward without imparting the wishes of the Government to these people.

Spring tides in this part have a rise and fall of twelve feet. One full tide occurs in twenty-four hours. The very low tide takes place in the evening, when several miles of foreshore are left dry by the receding waters. The current of the rising tide sets vigorously towards the east, and that of the falling tide westerly. The mornings were usually calm till about nine o'clock, when a breeze was generated from the northward. At noon it was southerly, where it remained for a period of about four hours, after which it decreased in force, changing back to the northwards, gently circulating from that direction during the night. Electrical disturbances and thunderstorms were of frequent occurrence, indeed, we may say daily. Circulating more rapidly than experienced elsewhere, they were always associated with heavy precipitations, originating in violent squalls. The maximum and minimum temperatures in the shade were 92° and 75° Fahr.

CHAPTER XI.

NORTH-EAST COAST.

“ But when the sun restored the cheerful day,
He rose, the coast and country to survey,
Anxious and eager to discover more.—
It looked a wild uncultivated shore.”

—DRYDEN'S *Virgil*.

THE north-east coast of the British Possession in Papua is comprised between East Cape on the south-east and Boundary Cape on the north-west, the Anglo-German boundary being defined thereat by Mitre Rock, the direct line joining these two capes being about 230 miles. Nearly the whole of this coast line is occupied by the bays of Goodenough, Collingwood, Dyke Acland, and Holnicote. A section of it lies adjacent to the D'Entrecasteaux group of islands, the space by which both are separated being known as the Straits of Ward Hunt and Goschen. This coast, which has hitherto been comparatively unknown, is most difficult to navigate, owing to the numerous obstructions of shoals and reefs that are scattered profusely along it. Hypothetically it had formerly been regarded as almost inaccessible, being occupied by a barbarous anthropophagous people, upon whom it would be difficult, if not altogether impossible, to throw a gleam of the light of civilisation. From the proximity of the mountain ranges to the seashore, approaches thereto were always regarded with suspicion. No harbours were supposed to exist, and no rivers of appreciable magnitude had been discovered, so that no specially attractive features were known in the inhospitable and hostile region. Recently, however, the pall of obscurity which for ages clothed the coast has been uplifted by the

British New Guinea Government, and we are now enabled to describe its geographical conditions with some degree of authority.

The physical features of Goodenough Bay are most prominently developed upon its southern aspect, where several patches of table-land, formed by the débris from the high coast ranges, are met with. At the head of the bay the physical changes are specially marked by an extensive area of low undulating country, probably twenty-five miles in breadth. This is clothed with forest; but the coast range, which is about from 2000 feet to 3000 feet in elevation above the sea, is almost destitute of the usual luxuriant mantle of vegetation. Its seaward face is steep, and almost devoid of attractiveness. A great part of the available low-lying lands are occupied by native cultivated areas, so that the scope available for European enterprise in the cultivation of the soil is narrowed down almost to a minimum. A few patches of cocoanut palm are met with in the immediate neighbourhood of villages, but just enough for domestic wants appeared to be all the people desired to produce.

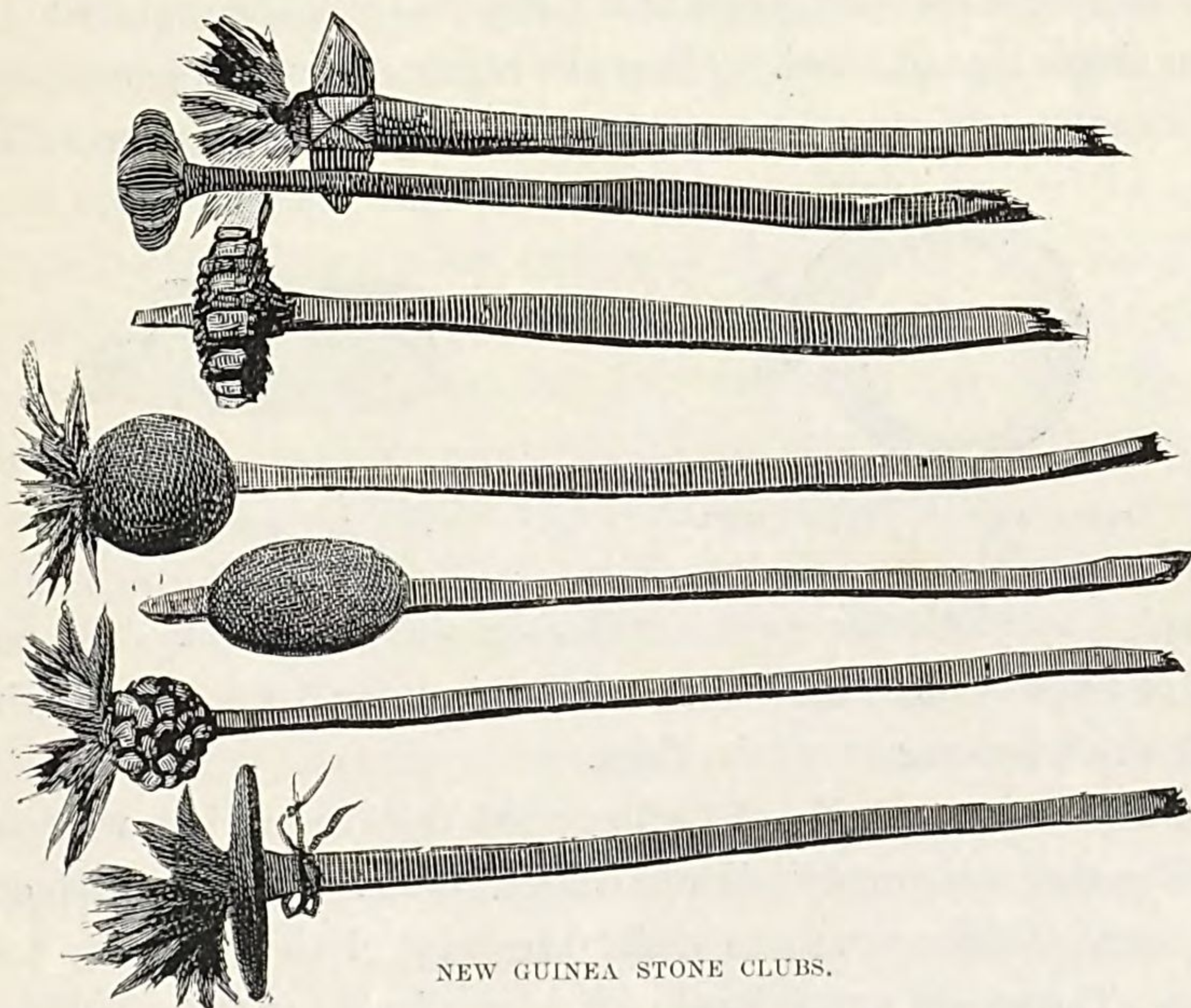
The native villages are located at convenient sites along the shores of the bay. Some of these contain about forty houses, built on piles on the beach. The walls of these houses are about three feet in height, with the space beneath them closed by the leaves of the cocoanut palm. The roofs of the houses are low, and not at all suited to afford protection to the occupants against the heavy rains of the region. This inferior class of dwellings is used by the tribes inhabiting the whole coast line of this part of the Possession. Their cultivated products consist chiefly of the banana and sweet potato, which, together with other articles of food, are cooked in wide-mouthed clay pots, upon which elaborate ornamentations are tastefully imprinted. The spaces between the houses are kept clean and occupied by ornamental trees and shrubs. Two masses of coral, attaining a height of about eighty feet, the sides of which are almost perpendicular, and in places actually overhanging, were discovered. Upon the crowning eminence of these

interesting features some small houses were observed; they were accessible by means of wooden ladders, so constructed that their removal can easily be effected, when not needed, by the villagers. These houses appeared to be used for defensive purposes, as munition of war was observed occupying places in the household. The people, who, although at first sight of European visitors were remarkably shy, evinced no hostile movements, nor did they remove their women and children from the villages upon the approach of strangers.

Collingwood Bay is an indentation of some considerable extent, encroaching upon the spurs of Hornby range, and being flanked by Cape Sebiribiri on the south, and Cape Nelson on its northern aspect. In the neighbourhood of Sydney Islands the physical aspect of the country assumes an undulating character: of coral formation, the low hilly country extends back to the spurs of the main mountain range for a distance of probably twenty miles, where the highlands attain altitudes of from 800 to 1000 feet above sea-level. Sydney Islands are composed of coral, only slightly elevated above the surface of the sea; they are clothed by a mantle of trees, but their insignificant area of only a few acres is probably the principal reason they are not inhabited. The mainland shores for some distance west of these islands are occupied by isles of coral and mangrove, whose continuity is only broken by the irregular narrow tidal channels by which they are separated from one another.

The natives in the neighbourhood of Keppel Point were at first very shy and almost unapproachable, but, after being convinced by practical demonstrations, commercial in character, that nothing but a desire to ameliorate their condition was contemplated by Sir William MacGregor, they were inspired with confidence, and free intercourse of the most peaceable nature took place. For arms these people use the spear and stone club; upon the latter they place very considerable value; indeed, the available resources of the European party were not equal to purchase one. Their shield of defence consisted of wood overlaid with plaited cane; its length being two-and-a-half

feet by one foot in breadth. They salute one another by touching the nose and navel, an operation of some considerable concern to the habited European accustomed to a more convenient and conventional form of indicating friendly feelings. Instead of resorting to the unpleasant operation of pulling the hairs out by the roots, they cut the eyebrows off; but although that part of the face is robbed of its natural ornamentation, they in a measure offer compensation by cultivating beards. Their garment consists of a loin-cloth, pro-

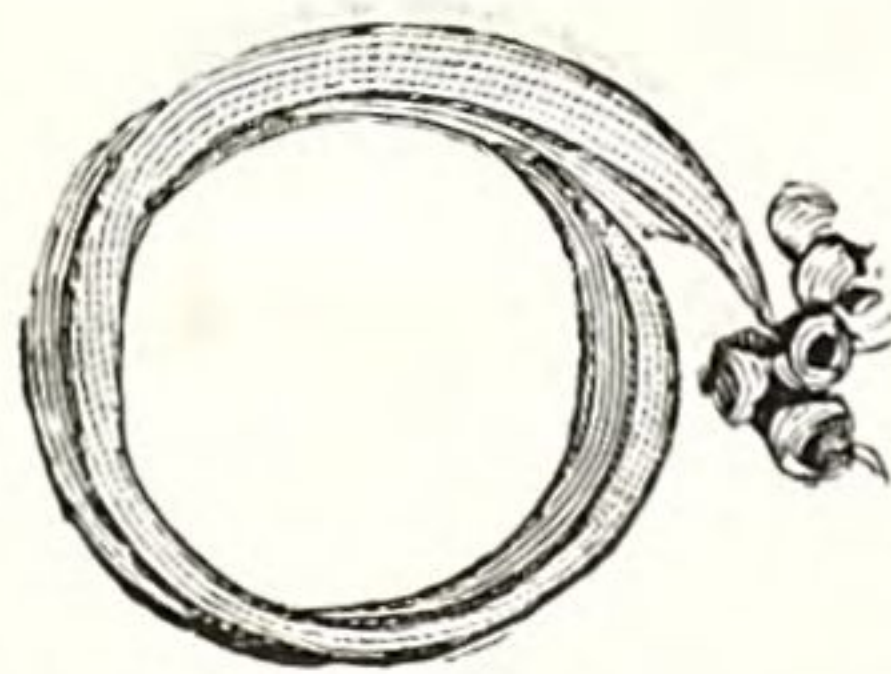


NEW GUINEA STONE CLUBS.

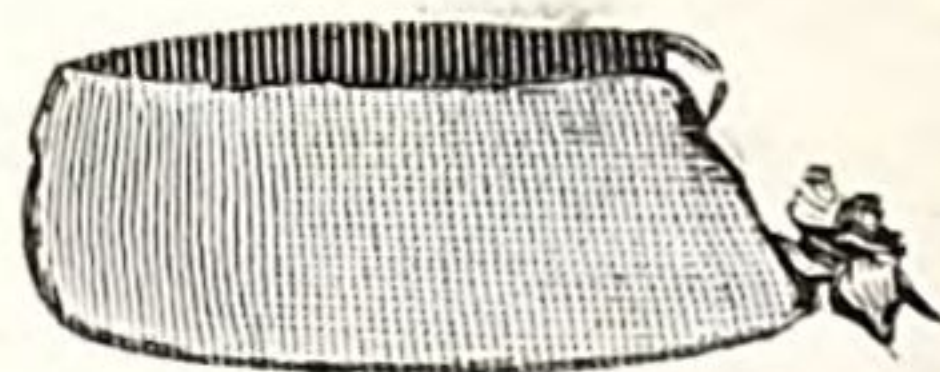
bably manufactured from the bread-fruit tree bark, and for ornaments they wear armlets of plaited ferns, narrow rings of shells, earrings of turtle or cocoanut shells, also strings of large and small white cowries. They consume the taro, sugar-cane, and betel-nut, but the spoons used for the latter possess none of the gracefully carved designs peculiar to those of other parts.

The villages of this Maisina tribe are constituted of separate small houses, used for family purposes, and a large building, which serves

as a club-house for the male section of the clan. This is in the form of a shed covered by a roof that on one side is continued to about three feet from the surface of the ground, under which is constructed a platform used as a verandah, upon which their wide-mouthed clay cooking pots, spears, nets, and other things of household use are laid. At a higher level of about eight feet from the ground another platform is constructed the entire length of the building, which is used for sleeping upon. They possess some large canoes, of about forty feet in length and two and a half wide, sharp at the ends, and made from single logs of wood. These are balanced by outriggers projecting about twelve feet from their sides, the intermediate space being



SHELL ARMLET (FRONT VIEW).



SHELL ARMLET (SIDE VIEW).

occupied by platforms constructed upon the cross-bars. The people had no knowledge of the use or value of iron and tobacco, and evinced no desire whatever to obtain them.

On the western side of Collingwood Bay the natives were using adzes made from stone, similar in colour to jade. They had keen edges, and were tough enough to resist breakage of their edge by proper usage. The people at the head of the bay dispose of their dead by interment in the village, where the silent resting-place of their mortal remains is adorned by lovely plants of the croton and dracænas varieties. No barrier and unbroken shore reefs afford protection to the head coast of the bay, where navigation is not unattended by dangers and obstacles arising from the shoals of coral patches with which its waters are copiously strewn.

The north-western headland of Collingwood Bay, terminating in Cape Nelson, is occupied by two interesting mountain features of

considerable prominence, whose spurs and outliers are washed by the ocean's briny waters. It is a pity that, when these prominences were first designated, the name "Victory" should not have been applied to the feature possessing the greatest eminence; for it will, we are sure, be conceded that Mount Victory should occupy a more exalted position than Mount Trafalgar, especially when both are so appropriately united to Cape Nelson. Mount Trafalgar, which lies north of Mount Victory, rears its proud head 4000 feet above sea level; its wooded spurs are shot out unbroken to within about two miles of the shores of the Cape, where a general disintegration commences, leaving the intervening area occupied by conglomerate ridges of from 100 to 200 feet high. These ridges, which are covered with grass, are separated by gullies and deep ravines, and occupied by a large native population. The spurs of Mount Trafalgar are clothed with dense forests and vegetation, continuing unbroken to its summit, which culminates in a conical peak, with a north-western crest occupying a less elevated and pronounced position.

When in the neighbourhood of Keppel Point Sir William MacGregor discovered the volcanic character of Mount Victory, and traced its rugged and precipitous conformation, from the low wooded spurs constituting its base to the bare rocky masses of its crown. Rising from the low wooded country fringing the northern shores of Collingwood Bay, this interesting mountain culminates, at an elevation of probably from 3500 to 3900 feet above sea-level, in two well-defined crests. From near its summit to base the eastern aspect of the mountain presented a furrowed appearance, but, as no indications of lava could be detected, this, it was thought, had been caused by recent landslips of great magnitude.

It was in the early morning when Sir William first descried a dense column of steam issuing from one of the ridges below its crest; and subsequently an early morning hour revealed several similar jets escaping from fissures in and around the crests of the mountain. No definite nor useful information concerning the past and present history

of Mount Victory could be obtained from the natives located in its immediate neighbourhood. A sharp shock of earthquake had occurred in the bay some three weeks prior to Sir William MacGregor's visit, which probably was associated with the internal condition of the mountain.

Cape Nelson consists of a headland, the conformation of which is remarkable for its succession of deep water indentations and grassy ridges. Of these inlets there are no fewer than thirteen, each being separated by distances of from half a mile to a mile. Two of these features, named Maclaren Harbour and Port Hennessy respectively, are secure havens, in which vessels may find security under almost any conditions of weather. These tongues of land are fringed by mangroves or forest, and skirted by shore reefs of about half a mile in breadth. From the proximity of Mounts Trafalgar and Victory, and the general conformation of the coast line, the country in the immediate neighbourhood of Cape Nelson is exceedingly interesting and likewise picturesque.

The approximate geographical position of Phillips Harbour, in Collingwood Bay, is latitude $9^{\circ} 30'$ S., longitude $149^{\circ} 13'$ E.; and that of Port Hennessy, Cape Nelson, $9^{\circ} 1'$ S. latitude, and $149^{\circ} 12'$ E. longitude. Between Capes Nelson and Sudest the coast-line is indented by Dyke Acland Bay; this is flanked on its western aspect by Hydrographer's range, whose spurs are stretched out to the seashore. This bay, which affords little security for shipping in boisterous weather, is thickly populated by natives, who closely resemble those described to the eastward. The country skirting its shores consists of high forest and grass-covered ridges, which substantially constitute part of the base of Hydrographer's range, the altitude of which is probably 4000 feet above sea-level. The spurs of this range are occupied by a native population of about 2000 to 3000, who cultivate the taro, yams, sweet potatoes, bananas, and sugar-cane; they also possess abundance of cocoanuts, which grow in patches on the highland slopes. Tattooing appeared to be prac-

tised by some of these people, whose faces bore traces of its markings, which, however, were badly executed. They were at first very suspicious, and earnest entreaties for some time failed to encourage successful intercourse. Their timidity was, notwithstanding, eventually overcome, and friendly relations were successfully established with some of the most powerful tribes of this district; nothing could, however, induce them to part with any of their stone clubs, which to them appeared to be invaluable.

A site was chosen by the Anglican Mission for a station in Oro Bay, the position of which is approximately in latitude $8^{\circ} 48'$ S., and longitude $148^{\circ} 31'$ E. This, with the other proposed stations in Collingwood Bay, should prove most valuable fields for missionary enterprise in a part of the Possession hitherto untouched by the influence of Christianity, where the dark tribes are slaves to superstition and all the other evils arising out of pure heathenism. Truly this is a grand and glorious harvest-field for representatives of the ancient Anglican Church to labour in.

From Cape Killerton the general coast-line lies in the direction of slightly west of north to Boundary Cape; the intermediate section between these two points possesses a slight curvature towards the west, which bears the name of Holnicote Bay. The western flank of this bay, terminating in the Anglo-Dutch boundary, consists of a succession of hills and ridges of from 50 feet to 400 feet above the mean level of the ocean. These undulations, which are covered by forest and occupied by native tribes, skirt the shores of the coast so closely that the spurs of some are bathed in the agitated waters of the sea. The vegetation upon the slopes of these ridges is diversified by cocoanut palms and a few sago palms. The region inland from the coast ridges consists of a very considerable expanse of low wooded country, extending to the spurs and outliers of the great Owen Stanley range. It is very disappointing that as yet no accessible water channels of communication to these areas of desirable country have been discovered. Natives of both sexes were met with in very

considerable numbers. Sometimes the Government party found itself in the midst of from 400 to 500 of these noble savages. They are physically a very fine-looking class of people, and their attitude towards the Europeans throughout the intercourse held with them was agreeably friendly. The male section of some of these tribes wore ornamentations round the curve of their chins consisting of nothing more than false whiskers; the hair of some of the men was worn in the form of matted ringlets, and the heads of others were adorned by great woolly mops. Supplementary to the natural coverings of the head they use artificial ornamentations of elaborately arranged cassowary feathers. They use jade adzes and disc-shaped clubs of basalt; but the value of these was so very great that no consideration was sufficient to induce them to part with any by barter. The language they spoke was apparently different from that of any other known part of the Possession, and consequently little useful information concerning their social condition could be obtained.

Boundary Cape, so named by the late Major-General Sir Peter Scratchley, is formed of low hills, consisting of metamorphic rock clothed by forest, and rising to altitudes varying from 400 feet to probably 500 feet above the sea. No visible signs of native village centres were met with within a radius of about five miles from the pyramidal block which marks Boundary Cape, about one quarter mile off its shore. This remarkable prominence, which is known by the name of Mitre Rock, is a conglomerate mass, probably sixty feet in height, with a basal diameter of similar measurement, through which an aperture of probably twelve feet in height and about three feet in breadth extends in the direction of north and south. This huge pinnacle, whose top is covered by vegetation, is a landmark not easily mistaken; it is remarkable not only for its physical appearance, having as it were been projected out of the water from the mouth of some mighty submarine cannon, but also from its unique geographical position with respect to the eighth parallel of latitude,

upon which it is almost exactly located; indeed, it is possible that upon the accurate determination of its position, the one may actually be found to intersect the other. A short distance south-east from Mitre Rock stands a bold projecting object some few yards from the shore, upon which the name of Craig's Pillar was bestowed; and probably half a mile south of this an interesting indentation of the coast line was discovered, to which the name of Douglas Harbour was given, at the head of which a fresh-water creek disembogues.

One of the results of our acquaintance with this part of the Papuan land has been the establishment of a relationship with the several native tribes, the issues of which cannot be regarded otherwise than happy; in other respects several secure harbours have been discovered where formerly their existence was regarded as improbable. Taken as a whole, the population is large, and the capabilities of the soil are apparently no greater than the wants of the people demand. Of the value of the uninhabited low swampy areas no estimate can be given until an extended examination has been effected. From a scenic standpoint the north-eastern coast offers greater attractions than any other known part of the Possession, and judging by the physical appearance of its inhabitants the climate is probably a healthy one. The absence of known rivers, however, robs the territory of much of its natural attractiveness.

Far away to the north and north-east of East Cape lie the islands of Trobriand, Woodlark, and Laughlan, between the parallels of $8^{\circ} 25'$ and $9^{\circ} 23'$ S. latitude and the meridians of $150^{\circ} 30'$ and $153^{\circ} 40'$ E. longitude. Of these the Laughlan group, or, as they are called in the vernacular, *Nada*, occupy the most easterly and southerly position. They occupy an area in the form of a crescent, with the concave aspect opening to westward. The group consists of ten, viz. Wabomat, Budelun, Wasimu, Oburak, Bukulan, Ozareo, Sureb, Kuneotu, Bwani-Bwani, and Tamaris. The longest, Wabomat, is geographically in latitude $9^{\circ} 17'$ S. and longitude about

153° 37' E. The lagoon of this atoll, which is from seven to twelve fathoms in depth, is picturesque and interesting, as well as secure for anchorage. The islands are low, being only a few feet above high-water mark, and clothed by trees, cocoanut palms, and other forms of vegetation. The soil is scant, and the natives have to depend, to some considerable extent, upon their neighbours of Woodlark Island for planting-ground, to whom they pay some consideration for the privilege. When scarce with themselves, they also purchase yams or sweet potatoes from them. According to Mr. Tetzlaff, the total population of Nada numbers 169. These possess a great number of canoes, in which their trading and fishing are conducted. In conducting intercourse with Europeans these natives affected articles of civilised clothing, and endeavoured to show loyalty to the Crown by attempting to converse in the English tongue. They are in appearance of the usual Papuan cast, but they neither war amongst themselves nor with their neighbours; and, although differing from them in dialect, in social ways they are akin to the inhabitants of Woodlark and Trobriand Islands. In the absence of a recognised chief for the group, each village controls its own affairs under the auspices of the leading men of the community. Apparently healthy for the abode of man, these islands possess a plentiful supply of fresh water, and are in other respects most desirable dwelling-places. The only representative of the whites here is Mr. Tetzlaff, "a resident trader," whose annual copra export is about forty tons, which costs him about 18s. per ton to produce, and for which he receives £7 per ton on the spot. He has been a resident of Nada for about nine years.

Woodlark Island is situated slightly to the north of west from Nada, the position of Guasap Harbour on the southern aspect of the eastern end of the island being in latitude 9° 10' S., and longitude 152° 55' E. This island, which extends longitudinally from east to west, is about thirty-eight miles in length. Some time ago it was the scene of a remarkable drama, in which the principal actors

were brutally murdered. These were Messrs. Kickbush and Neilson, who, trading in the cutter *Albatross*, had procured a native boy at the island of Panamotal to help in the general work of the vessel. It was by this youth they were subsequently betrayed and foully massacred. Kickbush, who was ashore, had finished the day's sport of shooting pigeons, and was sitting on the beach to rest when he received the tomahawk of Vivigi, an accomplice, in his forehead. After despatching their victim they proceeded on board the cutter, where Neilson was lying sick, and inflicted upon him wounds which caused his death. The natives then pillaged the vessel, which subsequently went to pieces on the reef. In July 1890 Sir William MacGregor visited these people, and after very great exertions, accompanied by danger to life, two of those actually concerned in the murders were captured and safely placed in prison, there to await trial. During the progress of the operations organised to effect these captures the people evinced most unmistakably hostile intentions. Indeed, at one time it appeared almost impossible to prevent shedding blood. Murua, as Woodlark Island is called by the natives, was occupied between the years 1847 and 1852 by the Marists, who laboured in the cause of Christianity with devoted love and zeal to which it is not easy to furnish a parallel.

By the observations obtained on board the *Merrie England*, Guasap Harbour was found to afford many favourable advantages to maritime enterprise. Its waters are not less than eight fathoms deep, with the bottom consisting of sand and mud. The native inhabitants are of Papuan type, being possessed of activity and intelligence not always met with in the race. They have entered the iron age, stone implements being now most difficult to procure. For arms they use the spear, shield, tomahawk, and knife. The former is made from the ebony wood, and the shield of light soft wood painted white, red, and black, in the form of two snakes preparing to capture two birds. Food, which consists of game, taro, and sweet potatoes, is abundant. The belief entertained by

these islanders of a future state is remarkably strange to orthodox Europeans, notwithstanding the charm of its simplicity, which doubtless invests it with a general popularity. All people, whether good or bad, when snatched away by death, go like the wind to the small island of Watum; there they enjoy the full pleasures of life, the women cultivating and cooking food for their lords and masters. Murua is of the usual formation, its soil, excepting in few places, being poor in quality.

The Trobriand Islands are located to the north-west of Murua, the largest being in latitude about $8^{\circ} 30'$ S., and longitude about 151° E. The islands of Gawa, Kwewato, and Jouvency are formed of coral, and densely populated. The latter is interesting because of its precipitous faces, overlooking the ocean and successive coral terraces. Some of these bold cliffs require to be scaled by means of ladders. The natives at the time of Sir William MacGregor's visit were very friendly disposed, being most anxious (almost immoderately so) to trade. In appearance they are typical Papuans, possessing considerable knowledge of wood-carving, for which munificent nature supplies material admirably adapted to that purpose.

The inhabitants of the island of Kitawa are remarkable for their shield-dancing, which is performed by an accompaniment of dexterous movements of a kind of double shield which the dancer wields with graceful effect. It is held in the middle by a bar probably an inch and a half thick, the ends of which, being carved, are flat on both sides. In social peculiarities and physical appearance these natives are closely allied to those of Murua. From the abundance of cultivated food, of which yams formed the greatest part, it was quite apparent that these islands possess areas of very great fertility. The fishing-nets are made from the fibre of the pandanus palm, and for cooking-vessels wide-mouthed clay pots are used. They catch great quantities of fish, for which purpose numerous small canoes are kept. It was found, upon Sir William

MacGregor's personal inspection of some of these islands, that the group is more extensive than had previously been supposed, both in regard to its population and capabilities—so much so that several weeks would have been required to accomplish its exploration satisfactorily.

CHAPTER XII.

RECAPITULATION.

“With vivid words your just conceptions grace,
Much truth compressing in a narrow space.”

—PINDAR.

It is perhaps well to offer a few brief remarks upon the general and actual results of European enterprise in the Papuan land, which ought henceforth to be called *The Land of the Brilliant Plume*. In doing this reference ought also to be made to the actual value of these results, both from a scientific and commercial point of view. Although darkness still obscures much, there can be no manner of doubt that generally speaking we are in possession of useful knowledge of the leading physical features of the territory. We are also fairly well acquainted with the interior conditions of the numerous islands adjacent to the south-east shores of the Possession, of the igneous origin of some, and the seismic conditions of others. We also have possessed ourselves of many geographical facts from the northern coast, where we have been able to show that Mount Victory possesses great internal heat, and that its central core is in consequence the seat of great activity. It may probably be discovered upon a closer and more minute inspection that the base of this interesting mountain has at some period of its life been entirely surrounded by water, the low-lying land on its inland aspect having been the result of upheaval.

Several new bays have on this northern coast been added to these previously known; but the failure to discover useful watercourses of communication is exceedingly disappointing, and, should more detailed

inspection be in like manner rewarded, it cannot be otherwise than apparent that the absence of water highways to interior regions will greatly retard enterprise and British influence, and colonisation in the northern section of the territory.

Our increased knowledge of the alpine zones is somewhat considerable. We can now for the first time assert with some degree of authority that our former conceptions of the magnitude of the Owen Stanley range will have to be very considerably modified; the continuity of that great range we now know ceases practically at the south-east buttress of Mount Victoria, whence broken masses occupy the terminal space between it and the Mount Obree regions, which we are now justified in regarding as a distinct range of mountains.

The extremely rugged and precipitous character of these regions will, however, for all time prove an insuperable barrier to settlement, and must seriously impede scientific inquiry. Even should valuable timber and other commercial products be discovered, the question of accessibility and practicability will always be a serious one for consideration in the formulation of schemes for individual or combined effort. Of the Vanapa basin we are also in the possession of valuable information concerning topography. We now, for the first time, know that the waters of the Vanapa are those of the Owen Stanley range, which are drained entirely by this rapid watercourse. The basin itself offers no facilities for European settlement, but the stream may probably be of some value in affording means of transport to and from the highlands.

For richness of soil and extent of agricultural and pastoral lands, the St. Joseph River district is probably without equal in the Papuan territory. Geographically it occupies a central position on the coast-line, and the areas of fertile land are within comparatively easy access from the sea-shore. It is the seat of agricultural products, more especially the taro (*colocasia esculenta*), which attains great proportions in the rich moist soil. The actual resources of this fertile region are not yet elucidated, but from such data as we already

possess, we are justified in believing that this district, above others, will probably command the best attentions of colonists. The neighbourhood, it is true, is a well-populated one, but that need not clash with European enterprise, provided a policy of discretion is rigidly maintained.

We are now more intimately acquainted with both the lower and the upper Fly River regions than at any other period of our history. We can take a fairly comprehensive view of the basin in its general aspects, and we are not altogether ignorant of the capacity of the stream, while to the knowledge of its tributaries we have made several important accessions, notably the Palmer and Black Rivers. It is, however, a matter for serious regret that the lower, and, we may also say, the middle regions of the Fly, are practically unsuitable for settlement, the climatic conditions being so inhospitable, and the general aspect of the whole region being so uninviting and unattractive, that probably few would care to forsake civilisation, with its attendant comforts, to seek the dangers and hardships of pioneering enterprise. Even the widely scattered native tribes inhabiting the margin of the stream are not exempt from the hostile features of clime, nor are they always amply provided for by the scanty products of the region. We may therefore fairly conclude that probably a lengthened period will elapse ere its capabilities are tested by settlement. Probably, it is true, the available areas are well adapted for the growing of rice and sugar-cane, but so long as kindred localities in other parts continue to offer superior inducements, it is clear that no developments of consequence are likely to occur in the Fly basin. The upper region of this great watercourse may probably, however, be more favoured than lower levels, in which case the undulating areas in the neighbourhood of the Palmer and Black Rivers will doubtless be the first to receive attention. In addition to the knowledge recently acquired of the actual features of the channel and the river itself, we also possess a fair orographical sketch of its extensive watershed, especially in the neighbourhood

of the Victor Emanuel and Mount Blücher ranges. Still, on the whole, we have much to learn of details.

Although, generally speaking, we are constrained to decide unfavourably upon the Fly basin for British settlement and on the inducements it may offer to enterprise, it must be stated that for commercial purposes its lower region in the neighbourhood of Kiwai Island is not without attractions. It is famous for its bananas and for a variety of vegetable products, which, if exported to British markets, would very probably command a ready and profitable sale.

While the regions just referred to are monotonous and uncongenial, those to the westward as far as the Anglo-Dutch boundary are no more attractive, nor do they offer more favourable inducements to settlement. The creeks and navigable channels are mostly salt-water estuaries, except Morehead River, which proves a happy exception to the rule. This watercourse is a newly discovered geographical feature which recently has been added to the numerous other discoveries of Sir William MacGregor. He ascended it for the first time to some considerable distance, and, even at the point where the expedition turned back, the channel was deep and the stream sluggish. However, even on this river some considerable distance inland will have to be traversed to find suitable localities for settlement. Probably this obstacle might in time be overcome, but even then the low swampy nature of the lower region will always impede the progress of enterprise.

As yet our insight into the geology of British Papua is both elementary and fragmentary. Based upon no special geological examination, our acquired knowledge is more hypothetical than practical, being derived chiefly from examination of collected specimens, which probably do not fully represent the primary conditions of the localities from which they were obtained. Notwithstanding, it will be freely admitted that many useful and practical data are available upon which a general sketch may be based. The first collection of specimens from the Fly River revealed the auriferous character of

that part of the territory. Although the analysis was based chiefly upon some stone tomahawks of altered sandstone and greenstone, or diorite, the results obtained were indicative of the existence of gold; while the conclusions regarding the probably auriferous character of the high ranges of the interior are derived from an examination of the fragmentary specimens of slate, sandstone, quartz, greenstone, and jasperoid rocks, obtained from the coast east of Redscar Bay, also from the material collected by the expedition to the summit of the Owen Stanley range, upon which occasion indications of gold were actually obtained in the bed of the Vanapa River. Basaltic lavas occur frequently, and palæozoic rocks are met with in abundance. The fossiliferous rocks noticed were those belonging to the tertiary period, and of the specimens obtained, the first was discovered at Yule Island; others have since been obtained in several localities in the Possession, notably the upper Strickland River, where marine fossils, chiefly mollusca, were discovered. The occurrence of ammonites in the middle region of the watercourse was also proved.

It is clear, however, that in speaking of the palæontology of Papua much care and caution is necessary, and that even the best results obtainable are only of a fragmentary character, to which too great an importance must not be attached. Of the gold-fields of New Guinea we are in a position to summarise with some considerable degree of confidence, both with regard to the localities operated upon and the probable value of the issues of these operations. Although gold-bearing deposits have been obtained in several districts of the Possession, the chief and practically the only centre of great interest has been the island of Sudest, and, in a much lesser degree, some of the neighbouring islands, where gold in payable quantities has been procured. The most active, and consequently the most remunerative field, was that of Sudest in the bed of the Runcie River, where diggers have wrought for some time in endeavouring to unearth the yellow dust so dear to the heart of man. Watering Creek and

White's Creek were also fields of considerable activity, the collective number of miners who have wrought together on this island being probably about 300. This number does not, however, include the prospectors on the island of St. Aignan, where gold was obtained, but not in sufficiently large quantities to remunerate the labour bestowed on it.

It is a somewhat remarkable fact that the general geological features of British Papua are, in a very considerable degree, identical in character with those of Australia, some of the specimens being coincident with those of the silurian series from gold-fields in New South Wales, while some of the fossiliferous rocks were obtained from beds of clay similar to those at Geelong and Cape Otway, in Victoria. From the foregoing remarks it may not altogether be unreasonable nor unjustifiable to assume that mineral areas of great value may yet await discovery by the penetrating eyes of British enterprise and pluck in Papua.

Concerning the Papuans much could be said, much more, indeed, than the limits of this chapter could contain. A remarkable feature of the native inhabitants of British Papua is the numerous tribal divisions and the almost correspondingly different languages or dialects spoken by them. Even in localities separated by only a few miles the dialects spoken differ the one from the other, in some cases very considerably. The Motu, which is the language spoken and taught by the missionaries at Port Moresby, is understood over a very considerable area both east and west of that place; but outside of that neighbourhood changes and variations occur, so that at the head of the great Papuan Gulf and in the Fly basin the Motu language is a foreign tongue. The same also applies to the eastern end, and to the islands adjacent thereto, where the dialectic variations are numerous and conflicting. While in the one case the people met with in the highland zones of the Owen Stanley range spoke a dialect akin to that of the Papuan, those encountered on the upper Fly River expressed themselves in a tongue every word of which

differed from that spoken by the tribes on the lower regions of the river, and from that spoken by any known coast community, notwithstanding that the people themselves exhibited no evidence of possessing distinctive characteristics of race, the only marked contrast being in lightness of colour. In the western division the same diversity of speech is met with, where neighbouring tribes are unable to hold intercourse one with the other, even if friendly, by reason of incompatibility of language. No doubt this may in some measure be accounted for by local environment, constant intertribal war being the means of isolating communities, so that no friendly intercourse could have been held, by which means, together with other causes, an incongruity of language may unknowingly have been established. Of the ethnography of these natives we do not as yet possess sufficient data to speak. Its elaboration must therefore be left to future generations.

The dress of the Papuan—if indeed it can be so called—is an object of some considerable interest, and one upon which many pages might be written. The dress or covering worn upon ordinary occasions comprises nothing more than luxuriant nature offers its children, its most remarkable feature being its simplicity; but the gorgeous outfit of the warrior and the dandy exhibits wonderful power of design and resource, with no small degree of patience bestowed by the wearers in placing and perfecting the ornamentations. The opulence of the Papuan feathered fauna has no doubt a very considerable influence on the natives in the preparation of their toilet, as we observe their head decorations and the ornamentations of their weapons to be constituted very largely of the brilliant plumes of the birds of paradise, and other beautiful fliers of the woods. In addition to these plume ornaments, they give great attention to the manufacture of shell ornaments and ornaments made from ivory, wood, and bone.

Concerning their marriage laws, rites, and customs, we possess no useful knowledge. It has been said that wives are obtained

by purchase, but more probably the usual practice of offering the relatives of the bride some few presents has led to the supposition that actual purchase had been effected, when in reality the contracting parties were only conforming to an old time-honoured social institution. Polygamy is countenanced, but the hard struggle for existence in many of the districts, especially those of central position, restricts the practice to a minimum.

The food consumed by the natives is chiefly vegetable: in the rich agricultural districts yams, taro, and sweet potatoes are the principal cultivated articles of diet; but in poor, dry, and arid areas it not infrequently comes to pass that the only means of satisfying the cravings of hunger during certain seasons of the year is by the consumption of wild food, often scarce and unpalatable. Flesh obtained in the chase is at times a supplementary article of food, and to those living in coastal villages fish is sometimes added to the general *menu*.

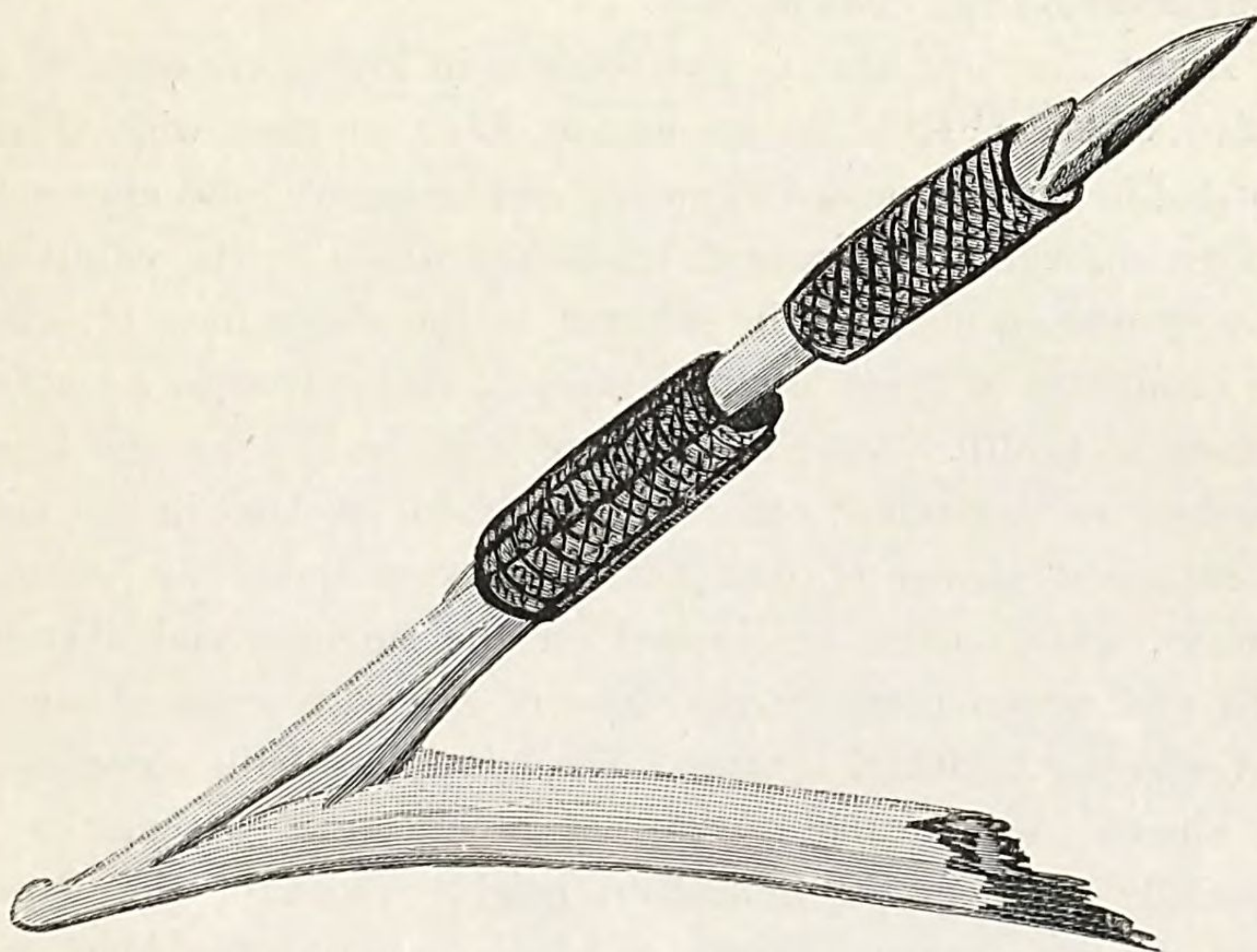
An interesting and important feature of their cultivated products is met with on the island of Kiwai, where a remarkable variety of yams and bananas occur, not mere fanciful differences, but actually well-defined variations of growth and quality. The absence of indigenous and cultivated fruit, however, even in districts of the greatest fertility, detracts much from the probable resources of the Possession. The native plantations, which are usually well cultivated, are in some places located on the available flat lands, on the margin of water-courses, and the forest areas; in other localities, especially the small islands adjacent to the shores of the mainland, the cultivated spaces are situated upon mountain slopes and ridges. Many of these areas are tastefully laid out, being subdivided into family or individual allotments and enclosed by substantial fences. The people are not by any means indifferent to the advantages of commercial enterprise, nor are they ignorant of the secrets of trade; in several districts recognised commercial intertribal relations exist, and, unless violated by internecine wars, these are rigidly respected. In their intercourse with

Europeans many tribes evince keen faculties for trading, and in their commercial transactions they are not regardless of equity. It has been chiefly when trading with the natives that outrages of an exceptionally violent nature have been committed; in some instances these may probably have been preconcerted from purely rapacious motives, but, on the other hand, many circumstances have been revealed which show that murders have been done and hostility offered to Europeans as punishment for acts of aggression which even the most inoffensive would consider worthy of resentment.

Our acquired knowledge clearly indicates that the natives inhabiting British Papuan territory are an agricultural people, living chiefly in fixed communities, possessing properly regulated and well-defined landed property rights, certainly not bounded by surveyed lines commonly used to indicate European land claims, but marked and known by natural features such as surface conditions afford, and which to the native mind are just as significant as are the professional delineations to that of the Britisher. Concerning tribal laws we can speak with no authority, nor can we adduce material data upon which to conduct scientific inquiry; we have collated a few fragmentary materials. For instance, we know that the punishment of death is inflicted for certain actions, that the dead are disposed of by different methods, each one being peculiar to tribal usage. We also know that feasting is conducted upon certain occasions and with periodic regularity; but of the particular reasons that prompt these doings we are unable to speak, chiefly by reason of the brevity of our intercourse with these people and the imperfect knowledge we possess of their language. As proper general surveys have not yet been conducted by the Government of the Possession, we know very little of the exact position and extent of tribal boundaries; probably the principal divisions are denoted by conspicuous natural features, such for instance as rivers, creeks, mountains, and headlands; but nothing useful can as yet be adduced concerning this subject.

Being a warlike people, and from childhood having been instructed

in the arts of warfare, it is natural to suppose that much attention is necessarily devoted to the manufacturing of weapons as well as to their practice. The weapons of these British Papuans consist chiefly of the bow and arrow, the spear, and several varieties of stone clubs, all of which are used with more or less effect and precision, especially the former, some of which are most formidable, requiring great muscular strength to bend them. The arrows are powerful shafts of wood or reed, pointed with various substances, some with bone, some with the great toe of the cassowary, and others with very



STONE ADZE.

hard wood, often the wood of palms, all of which are inserted into the end of the shaft and secured by cord wrapped tightly round both and plastered over with a soft tenacious substance which hardens on exposure to the atmosphere. In addition to these some of the inland tribes use a detestable weapon for head-hunting purposes, which is called a "man-catcher." Their implements consist of the European knife and tomahawk, and their own shell and stone articles. Some of their stone adzes, which display

graceful execution of workmanship, are very effective in the hollowing out of logs of wood for canoes. The large Motu canoe, when fully manned and under full sail, is quite a sight. Those used for trading voyages are probably from forty to fifty feet in length, about three feet in depth, and probably the same in breadth; they are constructed of several hollowed out logs lashed together so as to form a great raft. Their masts are made of the mangrove tree, and their sails are composed of matwork sewn together in proper shape, the whole propulsive structure being kept in position by ropes manufactured from hibiscus bark.

About the most unattractive features in Papua are some of the native villages. It is no uncommon thing to meet with villages situated in and surrounded by swamp and mangrove, with approaches leading through tidal areas of mud-flats, which to the uninitiated is most uncongenial, for, in addition to the discomforts of access, the conditions of these localities must in themselves be a constant menace to health. Some villages are built in the sea, the houses standing on long stilts; other villages are on flat land in the midst of luxuriant groves of cocoanut palm surrounded by beautiful scenery, while others are located on the summits and slopes of hills and ranges commanding views of extensive areas of country and enjoying healthful breezes. The houses are built according to an almost inexhaustible variety of architectural designs; some, especially those in the immediate neighbourhood of the Papuan Gulf, are of enormous length, a house over 500 feet long being no unusual occurrence. Others are of great height, especially those called *elamos*, some of which are probably not less than seventy feet high at the end by which they are entered; other houses are built upon long stilts over a structure that is used as a platform, which is probably the most common form of building in the Possession. Some again prefer an aerial habitation, and these build their houses in the branches of lofty trees, to which primitive ladders afford access.

The Papuan fauna is of a fairly representative character, and especially interesting; it possesses no big game such as that met with in Africa or India, but its feathered fauna rivals that of any other part of the world. Of animals, those chiefly to be found in the Papuan land are the wild and domestic pigs, dogs, the tree kangaroo (*Dendrolagus dorianus*), wallabies, Cuscus, cats, rats, mice (*Bita*), &c. The pigs are animals of great value to the native inhabitants; they are fondled and petted like lambs, the young being suckled at the breasts of women, an abominable practice in itself, which is greatly intensified when associated with participating infants. The market value of the pig is occasionally equal to that of a human being. Some of the dogs are almost, if not wholly, identical with the Australian dingo, those met with on the upper Fly River being of a bright orange colour, somewhat graceful in appearance. Reptiles in British Papua are represented by a considerable number of different orders, the largest of which are the dreaded amphibious alligators, which are plentifully scattered throughout the territory in the rivers, creeks, and swamps, and a constant menace to human life. The snake family is well represented here, those met with, however, being for the most part common also to Australia; excepting the death-adder (*Acanthophis*) and the whip-snake (*Diemansia*), the greater number of reptiles are innocuous; lizards and frogs also abound in all parts of the Possession. Insects are in swarms, and scorpions also occur. Of the feathered family New Guinea can probably produce a more brilliant variety than any other island on the globe: there is the cassowary, the large and pigmy geese, ducks, fowls, pigeons, cockatoos, both black and white; parrots, kingfishers, hornbills, rifle-birds, several varieties of bower-birds, the cat-bird, and probably over twenty-five different species of the paradise birds, *Parotia Lophorhina*, *Paridigalla*, *Astrapia*, *Epimachus*, &c.

The climatic aspects of the Possession are of an exceptional character, and their influence on Europeans so severe that very few con-

stitutions can withstand their effect, a feature which will always be a great hindrance to settlement, and a constant menace to life. Of the temperature and rainfall no useful measurements are obtainable; we know, however, that although the temperature is not excessively high, the humidity is very great.

The European population of British Papua is composed of the Government officials, the missionaries (Wesleyan, Roman Catholic, and Anglican), also gold-diggers and traders.

APPENDIX.

APPENDIX.

I.

GEOLOGY.

LIST OF GEOLOGICAL SPECIMENS COLLECTED BY THE REV. W. G. LAWES, OF THE
BRITISH NEW GUINEA MISSION.¹

Specimens.

- I. From Kaiputupu—Angular fragment of green siliceous rock, probably Silurian schist.
- II. Do. do. do.
- III. & IV. From Kaiputupu—Quartz from a vein in same green rock.
- V. Bed of Kupaloloko—Water-worn fragment of pebble of dark-grey quartzite.
- VI. Bed of Kupaloloko—Two small angular pieces, similar to II.
- VII. Bed of Kupaloloko—Two angular pieces of jasperoid rock, with small veins of chalcedonic quartz.
- VIII. Bed of Kupaloloko—Three angular pieces of red jasperoid rock.
- IX. Fairfax Harbour—Three angular pieces black oxide of manganese.
- X. Fairfax Harbour—Five small water-worn quartz pebbles.
- XI. Bed of Kupaloloko—Fragment, $2\frac{1}{2}$ inches long, of a water-worn pebble of indurated schist, probably Silurian.
- XII. Bed of Kupaloloko—Greenstone, partly water-worn, containing magnetic iron oxide.
- XIII. Bed of Kupaloloko—Water-worn pebbles of green siliceous rock, probably altered Silurian, similar to Nos. I. and II.
- XIV. Do. do. do.

¹ Described by C. S. Wilkinson, L.S., F.G.S., &c., Surveyor in charge for the Colony of New South Wales.—*Annual Report on British New Guinea, from 4th September 1888 to 30th June 1889, Appendix.*

Specimens.

- XV. Bed of Kupaloloko—Angular fragment of greenstone.
- XVI. Bed of Kupaloloko—Water-worn pebble of greenstone, with vein of calcite.
- XVII. Bed of Kupaloloko—Pebble of altered black slate, containing small crystals of iron pyrites.
- XVIII. Taken out of gizzard of a Goura pigeon—Greenstone pebble ($\frac{3}{4}$ inch by $\frac{1}{2}$ inch in size), similar to No. XII.
- XIX. Fairfax Harbour—Angular piece of black oxide of manganese.
- XX. Fairfax Harbour—Hard, red jasperoid rock, probably altered Silurian.
- XXI. From Quaibo—Numerous small water-worn pebbles of quartz, sandstone, slate, and red jasperoid rock.
- XXII. Bed of Kupaloloko River, near Mount Vetura—Sample of sand, consisting of about 35 per cent. of black magnetic iron oxide and specular iron, together with quartz, quartzite, trap rock, shale, sandstone, and jasperoid rock. Two assays of this sample gave respectively 3 dwt. 5 gr. and 2 dwt. 19 gr. of gold per ton, averaging 3 dwt. per ton.
- XXIII. Bed of Kupaloloko River, near Mount Mumkaihala—Sample of sand, consisting of altered shale and sandstone, quartz and quartzite, trap, and jasperoid rock, and some black magnetic iron oxide.
- XXIV. Bed of river between the coast and Mount Astrolabe, and south of the latter—Sample of sand, consisting of limestone, tufa, quartz, quartzite, trap rock, altered schist, jasperoid rock, and black magnetic iron oxide.
- XXV. Same locality—Sample of sand, consisting of about 10 per cent. of magnetic iron oxide, besides altered shale and sandstone, trap rock, jasperoid rock, and limonite or brown oxide of iron.
- XXVI. From head of Hood Bay—Sample of sand, containing some recent marine shells, *Turritella*, &c., and consisting chiefly of decomposed trap and nodules of marl, with some small pebbles of slate, quartz, and jasperoid rock, and a few scales of yellow mica.
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LIST OF GEOLOGICAL SPECIMENS FROM BRITISH NEW GUINEA AND NEIGHBOURING ISLANDS, COLLECTED BY SIR WILLIAM MACGREGOR, K.C.M.G.¹

No.	Marks.	Names and Remarks.
1	Mount Kilkerran, north side— Base rock, slate quartz.— 3-11-88.	1 specimen quartzose mica schist and 4 specimens reef quartz, which gives no trace of gold by the iodine test.
2	North-east St. Aignan—Tra- chyte (?) slate quartz.— 21-10-88.	5 specimens finely laminated indurated micaceous sandstone or quartzite, and 1 specimen of a much weathered felspathic rock, probably a volcanic tuff.
3	Slate and quartz—Joannet.— 10-3-88.	1 specimen weathered mica schist marked "Johannet Harbour," and 1 specimen reef quartz of unpromising appearance.
4	Pumice and Pitchstone— Ferguson Island, Dawson Straits.—31-10-88.	Pumice and pitchstone. (See Mr. Clarke's notes, No. 1.)
5	Rossel Island, river boulder —Quartzose.—10-10-88.	In fragments. Looks like a micaceous quartzite, with vein quartz adhering.
6	Sudest Island, river bed—Slate and quartz veins.—10-10-88.	Micaceous slate with a little quartz adhering.
7	Veins in sandstone—High Island.—10-10-88.	One sample is a fine-grained sandstone of mixed siliceous and felspathic material. Two others are of vein quartz, one of them coloured greenish-yellow by protoxide of iron. The quartz gives no trace of gold by the iodine test.
8	Dividing Range, Milne Bay. —14-1-89.	Basalt.
9	Tauputa River.—15-1-89.	2 samples of compact white marble, and 1 of reddish clay slate.
10	Rossel Island—Slate and quartz.—16-10-88.	Slate and vein quartz, which gives a trace of gold by the iodine test.
11	Logea.—29-1-89.	Basalt.
12	Slate and quartz veins, South Rossel Island.—16-10-88.	Slate and quartz veins. The quartz does not look promising, but gives a trace of gold by the iodine test.
13	St. Aignan—Lime conglome- rate quartz slate, Middle Range.—23-10-88.	Apparently a very recent beach deposit. The conglomerate contains quartz and slate pebbles and fragments of shells. Its matrix is apparently derived from the waste of basalt and slate, and is slightly calcareous, being full of comminuted shells.
14	Sudest River Bed—Slate and quartz.—16-10-88.	Slate with small quartz vein adhering.
15	North Normanby—Porphyry (?).—1-11-88.	Weathered granite.

¹ Described by R. L. Jack, F.G.S., &c., Government Geologist of Queensland.—*Annual Report on British New Guinea, from 4th September 1888 to 30th June 1889, Appendix.*

No.	Marks.	Names and Remarks.
16	Rocks—Dividing Range, Mullin's Harbour and Milne Bay.—29-1-89.	Hard compact mudstone, a piece of calcareous tufa with shell fragments, and the "stone" of a fruit.
17	Moresby Straits, Goodenough Island.—9-10-88.	Vesicular basaltic lava. (<i>See</i> Mr. Clarke's notes, No. 2.)
18	Slade Island.—10-1-89.	11 pieces dolerite (basalt but macro-crystalline), 2 of acidic felstone, and 3 probably the same but weathered beyond recognition.
19	Teste Island.—14-1-89.	Grey limestone (good for mortar or as a building stone), and calcareous shale. [Fossils would probably be found in these and would be gratefully received. —R.L.J.]
20	Ferguson Island, Straits. West foot of Maybole Mt. (?).—7-11-88. Slate mica.	Highly micaceous gneiss.
21	Normanby, 2nd Anchorage—Dolomite (?). River Glen.—28-10-88.	Limestone. Would make a very fine building stone.
22	Samarai.—30-1-89.	Numerous fragments of weathered dolerite, and a large piece of quartzite containing patches of arsenical pyrites.
23	Ferguson Island, West End, Hughes Bay—Slate and quartz.—5-11-88.	2 fragments weathered dolerite, the larger with masses of mica adhering, and apparently from the junction of dolerite with a metamorphic rock, 1 fragment of fine-grained gneiss, and 1 fragment of quartz.
24	Goodenough Island, Dawson's Straits—Micaceous schists.—7-11-88.	Mica schist and weathered fragments of an altered conglomerate.
25	High Island—Quartz, slate veins.—10-10-88.	Quartz and 2 fragments of siliceous slate. The quartz gives a faint trace of gold by the iodine test.
26	Well Island.—2-11-88.	2 specimens pitchstone, 1 of basalt, and 1 (weathered) of trachyte (?).
27	N.W. coast Normanby Island—Riverbed wash.—1-11-88.	Re-cemented granite débris, with a few fragments of pitchstone.
28	Sudest—River sand and gravel.—18-10-88.	Pebbles of slate, schist, and quartz, and broken fragments of orthoclase felspar crystals, probably out of a granite. (<i>See</i> Mr. Clarke's Notes.)
29	Sudest River—Gravel and clay.—18-10-88.	Besides dry clay, fragments of slate, schist, and quartz. (<i>See</i> Mr. Clarke's Notes.)
30	Milne Bay—Stones and gravel. Both sides range.—26-1-89.	An iron oolite consisting of agglutinated concretions of iron peroxide, and débris of the same. NOTE.—The apparent low specific gravity of the stone is due to the open spaces between the concretions.
31	Normanby Island, 2nd Anchorage—River gravel.—28-10-88.	Fragments of slate, schist, and quartz, and a few broken orthoclase felspar crystals.

NOTES ON SAND AND GRAVEL, SUDEST RIVER, COLLECTED BY SIR WILLIAM
MACGREGOR, K.C.M.G.¹

The quartzes are but little worn.
Worn fragments of schist.
Worn slate.
Titanic iron.
Specular iron.
3 pieces of white glass, one worn.
1 shell.
3 or 4 minute but perfect quartz crystals.
No gold, tin, gems, or anything of value.

NOTES ON GRAVEL AND CLAY FROM SUDEST RIVER.

Quartz.
Schist.
Slate.
Abundance of clay.
2 pieces of glass.
No gold, tin, gems, or anything of value.

PETROLOGICAL NOTES ON TWO SAMPLES OF ROCK FROM BRITISH NEW GUINEA,
COLLECTED BY SIR WILLIAM MACGREGOR, K.C.M.G.²

No. 1. *Marked Pitchstone, Ferguson Island, Dawson Strait.*

This sample is very much cracked, the cracks radiating round centres which consist of quartz crystals in every case. The colour is pitch-black and very lustrous. To the naked eye quartz crystals alone can be detected in the black magnea. The radiating cracks are seen to the best advantage on the cut face. One such crack is depicted in the drawing annexed, No. 1. Across the south-west corner of the crystal a crack is shown extending into the homogeneous glass on either side. The glass enclosures with gas pores are well shown in the drawing. The sections only show feldspars (sanidine) and quartz under a low power; between crossed nicols a distinct evidence of fluxion structure can be traced.

In drawing No. 2, the enclosures in the tabular feldspars are shown but under the inch; the field is too small to give evidence of fluxion.

The glass is perfectly transparent grey, and, of course, isotropic between crossed nicols. There appear to be no other minerals present.

¹ Described by A. W. Clarke, Esq.—*Annual Report on British New Guinea, from 4th September 1888 to 30th June 1889, Appendix.*

² Described by A. W. Clarke.—*Annual Report on British New Guinea, from 4th September 1888 to 30th June 1889, Appendix.*

No. 2. Basalt, Goodenough Island, Moresby Strait.

Vesicular, with minute augite and felspar crystals visible to the naked eye. Under the microscope, between crossed nicols, augite crystals are seen in plenty with glass enclosures and magnetite. The augite is well marked, as shown in drawing No. 3. The sanidine crystal in the same drawing shows growth by accretion in a very beautiful manner. The ground mass is so opaque that minute plagioclase crystals not thick enough to reach through and touch each surface of the section do not appear by transmitted light at all, while by reflected light a very large number of minute pellucid crystals can be observed.

LIST OF GEOLOGICAL SPECIMENS FROM BRITISH NEW GUINEA, COLLECTED
BY SIR WILLIAM MACGREGOR, K.C.M.G.¹

No. 1. Bag marked "Top of Mount Victoria."—(a) Angular fragments of a hard crystalline, micaceous, and quartzose schist. (b) Translucent quartz, the joints of which are coated with white mica, from veins in the schists; two of the pieces of quartz have chlorite schist attached to them.

No. 2. "Vanapa River, Low Hills, 27-4."—Broken fragments of quartz, with clay schist attached to them. This quartz is from veins in the schist. It showed a trace of gold by the iodine test, but not by ordinary washing.

No. 3. "Vanapa River, 30 M., 26-4-89."—Angular fragments of indurated clay schist.

No. 4. "Vanapa River, 26-4-89."—Same as No. 3.

No. 5. "Vanapa River, 35 M., 27-4."—Angular fragments of quartz, with schist attached to them, same as No. 2.

No. 6. "Vanapa River, 29-4."—Fragments of hornblende porphyry. Thin sections examined under microscope show porphyritic crystals of hornblende, decomposing orthoclase felspar, and magnetite.

No. 7. "Vanapa River, 27 M. up, 28-4-89."—Angular fragments of a decomposed and altered sedimentary rock. Probably an altered sandstone.

No. 8. "25-4-89."—Same as No. 6.

No. 9. "Exton Junction."—(a) Fragments of a hard siliceous schist. (b) Quartz coated with calcite in a dark clay schist.

No. 10. "Exton Junction."—Water-worn drift of clay schist, with a few pebbles of quartz; no gold in the drift on carefully washing.

No. 11. "Top of Knutsford Range."—(a) Angular pieces of micaceous schist. (b) Quartz from the veins in the schist showing a trace of gold by the iodine test.

No. 12. "Between Knutsford and Musgrave Ranges."—A wash consisting of schistose pebbles with a few pebbles of quartz. A trace of gold detected in this drift by washing.

¹ Described by W. H. Rands, Esq., Assistant Government Geologist of Queensland. —*Annual Report on British New Guinea, from 4th September 1888 to 30th June 1889, Appendix.*

- No. 13. "Mount Kowald."—Well-cleared clay slate with quartz veins.
- No. 14. "Mount Musgrave, 8000 feet."—Decomposed micaceous schist.
- No. 15. "Mount Musgrave, 7000 feet."—Same as No. 14, with fragments of quartz from veins.
- No. 16. "Back of Musgrave Range."—Schistose drift, similar to Nos. 10 and 12. A trace of gold detected in the drift by washing.
- No. 17. "Native Camp, Mount Knutsford, 8800 feet."—A hard crystalline micaceous schist, very similar to that from Mount Victoria, No. 1.
- No. 18. "Mount Knutsford, Upper Vanapa."—Diorite, with porphyritic crystals of hornblende.
- No. 19. "Creek on Mount Belford."—(a) Rounded pebbles of basalt, containing olivine and augite. (b) An altered greywacke. (c) A drift consisting of pebbles of quartz and schist; the presence of gold detected by the iodine test in the drift.
- No. 20. "Taura Creek."—(a) Fragments of clay schist. (b) Quartz from veins in the schist.
- No. 21. "Camp No. 2."—(a) Angular fragments of clay schist. (b) Quartz from veins in the schist.
- No. 22. "Camp at Waterfalls."—Angular fragments of clay schist.
- No. 23. "Vanapa River, 17 M., 28-4-89."—A yellow sand from the bed of the river, containing coarse pebbles of slate, quartz, and trap rock. The sand consisted chiefly of grains of quartz and schist, with yellow mica magnetite, ilmenite, and small particles of zircon and topaz; on carefully washing the sand yielded, some fine colours of gold were obtained.
- No. 24. "Vanapa River, 17 M., 28-4-89."—A yellow sand from the bed of the river, containing some coarse pebbles of schists, slate, quartz, and trap rock. The sand consisted of grains of quartz, with yellow mica, magnetite, ilmenite, zircon, and topaz; some fine colours of gold were obtained on carefully washing the sand.
- No. 25. "Vanapa River, 17 M., 28-4-89."—A yellow sand from the bed of the river, containing coarse pebbles of slate, schist, and felspar porphyry. The sand consists of grains of quartz and schist with yellow mica, magnetite, ilmenite, zircon, and topaz. Some fine colours of gold were obtained on carefully washing the sand.
- No. 26. "Vanapa River, 17 M., 28-4-89."—A fine reddish sand from the bed of the river, containing a few coarse pebbles of slate. Fine colours of gold were obtained on carefully washing the sand.
- No. 27. "Quaipo, 21-2-89."—Fragments of coralline limestone.
- No. 28. "Quaipo, 21-2-89."—Impure limestone, containing what appears to be the cast of a *Spirifera*, but it is too indistinct to be named.
- No. 29. "Musgrave River, Tributary to Kemp-Welch Larumi, 27-3-89."—(a) Water-worn pieces of limestone. (b) Rounded pebbles of basalt, cavities of which are filled with zeolites. (c) A pebble of slaty mud rock.
- No. 30. "Kirapa Village, Garia, 28-3-89."—Several fragments of an altered and much decomposed rock.
- No. 31. "Village of Lakumi, 24-3-89."—A decomposing granitic rock. A

section of the above, examined under the microscope, shows it consists of hornblende, orthoclase and oligoclase, felspar, magnetite with viridite along cracks.

No. 32. "West horn of Port Moresby Harbour, from Stratified Cliff."—Fragments of stratified mudstone.

No. 33. "Schistose Cliff, Port Moresby, Quartz, site of Government House."—(a) Impure siliceous limestone. (b) Quartz containing iron pyrites. I obtained no gold by washing the quartz after roasting.

No. 34. "Sea Cliffs, Port Moresby, Quartz, Government House, 2-4-89."—Same as No. 33. The quartz tried by the iodine test showed no trace of gold.

No. 35. "Broad-arrow, Garia Gosoru, Rigo, 6-7-89."—(a) Black oxide of manganese in a siliceous matrix. (b) A hard siliceous rock, with joints filled with calcite. (c) Limestone.

36. "Broad-arrow, Garia Gosoru, Rigo, mixed, 6-3-89."—(a) Black oxide of manganese in a siliceous matrix. (b) Same as (a), but containing less manganese. (c) Limestone. (d) Altered serpentinous rock.

No. 37. "Broad-arrow, Rigo, mixed, 5-3-89."—(a) Jasperised quartz. (b) Green jasper. (c) Opalescent quartz. (d) Pyrolusite (oxide of manganese). (e) Pebbles of siliceous rock. (f) Carbonate of lime.

No. 38. "Broad-arrow, Kemaia, Rigo, 28-2-89, mixed."—(a) Reddish marl. (b) Fragments of calcareous grit, containing veins of calcite. (c) Jasperised quartz.

No. 39. "Broad-arrow, near to Station Rigo, 25-2-89, mixed."—(a) Jasperised quartz. (b) Lydianised quartz, with veins of opalescent quartz. (c) White quartz. (d) Hard fine-grained quartzose rock. (e) Slaty mud rock. (f) A decomposed trap rock, with calcite, (g) opalescent quartz.

No. 40. "Broad-arrow, Saroa, mixed, 1-3-89."—(a) Reddish marl, with calcite. (b) Mud rock. (c) Marl, with a large percentage of oxide of iron.

OUR PRESENT KNOWLEDGE OF THE PALÆONTOLOGY OF NEW GUINEA.¹

So little is at present known of the Palæontology of New Guinea, that it may perhaps be well to pass in review the different, although brief, papers relating to the subject, and to add what little information can be gathered from more recently made collections.

So far as I am aware, no fossils of Palæozoic, and only those of Mesozoic, age to the least possible extent have been noticed from New Guinea, and the existence of fossiliferous Tertiary rocks was, I believe, first announced by Mr. C. S. Wilkinson, who based his determination on a small series of specimens obtained

¹ By R. Etheridge, junr., Government Palæontologist of New South Wales, to whom the author is indebted for this most valuable contribution.

at Yule Island, during the progress of the *Chevert* Expedition, under Sir W. Macleay. During this exploration were obtained, amongst other rocks :—

- (1.) Oolitic limestone of Tertiary age, from Bramble Bay.
- (2.) Yellow calcareous clay, from the Katau River.
- (3.) Yellow and blue calcareous clays, from Yule Island and Hall's Sound.

The clays from the last-named localities were believed by Mr. Wilkinson, "as indicated by the fossils contained in them, to belong to the Lower Miocene Tertiary period,"¹ and to be similar to like beds at Geelong and Cape Otway, in Victoria.

From Hall's Sound, Mr. Wilkinson determined *Voluta macroptera*, M'Coy, *V. anticingulata*, M'Coy, and a number of other shells only named generically, and therefore of little use from any but a general stratigraphical point of view. The Katau and Bramble deposits were believed to be of the same age. The Yule Island rock is wholly composed of corals, shells, and echini, forming a "concrete of fossils." This paper was followed by two from the pen of the Rev. J. E. T. Woods,² entitled "On a Tertiary Formation at New Guinea,"³ and "On some Tertiary Fossils from New Guinea."⁴ Both these memoirs deal with the same fossiliferous deposit at Yule Island, which Mr. Wilkinson had before him. They are evidently intended as a refutation of the conclusions arrived at by the latter; but, strange to say, no mention whatever is made of Mr. Wilkinson having previously occupied himself with the subject. The first paper contains a description of an Echinid, *Temnechinus macleayana*, Ten.-Woods, and records as fossil the occurrence of a known living species, viz., *Peronella decagonalis*, Lesson. *Temnechinus* is a European and Indian Tertiary genus, and lives still, although, as Mr. Woods says, it is chiefly indicative of a Pliocene age. *Peronella decagonalis* is a recent species, met with in Eastern seas. The conclusion arrived at by the author is that the deposits yielding the fossils in question are not as old as the Murray River, Mount Gambier, or Cape Otway Tertiaries, but he regards them as Lower Pliocene.

In the second paper two shells are described, *Pecten novæ-guinæ* and *Dolium costatum*. These are held to confirm the previously expressed views, and Mr. Woods was of opinion that none of the New Guinea fossils were identical with those of Southern Australia. No mention whatever is made of the two univalves, *Voluta macroptera* and *V. anticingulata*, specially referred to by Mr. Wilkinson.

So far as I have been able to gather, the first reference to fossils of Secondary age from New Guinea occurs in Mr. C. S. Wilkinson's Annual Report on the Geological Survey of N. S. Wales for 1877,⁵ wherein he states that the collection of M. d'Albertis contained Ammonites. In an anonymous article in the Sydney

¹ *Proc. Linn. Soc. N. S. Wales*, 1876, i. pt. 2, p. 113.

² Since these remarks were written, Natural History has lost one of its most devoted followers by the death of the Very Rev. J. E. Tenison-Woods, which lately took place after long and painful suffering.

³ *Proc. Linn. Soc. N. S. Wales*, 1877, ii. pt. 2, p. 125.

⁴ *Ibid.*, pt. 3, p. 267.

⁵ Ann. Report, Dept. Mines, N. S. Wales, for 1877 [1878], p. 199.

Daily Telegraph,¹ Mr. Wilkinson is credited with assigning these Ammonites to the Upper Oolite or Lower Cretaceous. It is thus quite clear that about this time Secondary rocks had been recognised, support being given to this by some remarks made by Professor F. W. Hutton, in his excellent essay on the "Origin of the Fauna and Flora of New Zealand."² Therein he says: "Of the geology of New Guinea it is known that Jurassic rocks are largely developed both in the north and in the south . . . no Cretaceous rocks are known from any part."

The next publication bearing on the Palæontology of New Guinea was a paper by the late M. de Miklouho-Maclay,³ who described a large part of the coast thereabouts as nothing more than uplifted coral-reefs, but from a greenish sandy clay, forming the nearest hills to the coast-line at the village of Bongu, from 100 to 400 feet high, he collected thirty-eight species of mollusca. From the determinations of Mr. J. Brazier,⁴ who examined the collection, it is manifest that this deposit can only be regarded as of Post-Tertiary age. The species are identical with those now living in Torres Straits, the China Sea, and around the Philippine Islands. The following is a list of those specifically determinable taken from Mr. Brazier's paper:—

<i>Ranella albivaricosa</i> , <i>Reeve</i> .	<i>Corbula albuginosa</i> , <i>Hinds</i> .
<i>Nassa siquijarensis</i> , <i>A. Adams</i> .	<i>Tellinella macandrewi</i> , <i>Sby</i> .
<i>Oliva neostina</i> , <i>Duclos</i> .	<i>Arcopagia pinguis</i> , <i>Hanley</i> .
„ <i>lepidula</i> , <i>Duclos</i> .	<i>Phylloda foliacea</i> , <i>Linn</i> .
„ <i>ispidula</i> , <i>Linn</i> .	<i>Tellinides conspicua</i> , <i>Hanley</i> .
<i>Terebra staminea</i> , <i>Gray</i> .	<i>Peronæa scalpellum</i> , <i>Hanley</i> .
<i>Dendroconus glaucus</i> , <i>Linn</i> .	<i>Metis spectabilis</i> , <i>Hanley</i> .
<i>Strombus canarium</i> , <i>Linn</i> .	<i>Chione calophylla</i> , <i>Hanley</i> .
<i>Bulla ampulla</i> , <i>Linn</i> .	„ <i>imbricata</i> , <i>Sby</i> .
<i>Atys cylindrica</i> , <i>A. Adams</i> .	<i>Dione bullata</i> , <i>Sby</i> .
<i>Dentalium longitrorsum</i> , <i>Reeve</i> .	<i>Leda pullata</i> , <i>Hinds</i> .
<i>Corbula crassa</i> , <i>Hinds</i> .	

To within a few months ago this included all that was known to the writer of the Palæontology of New Guinea. Both the Germans and Dutch⁵ may have obtained collections from their respective portions of the island; but, if such is the case, the descriptions have not come under notice.

During the comparatively recent expedition to New Guinea in 1885, fitted

¹ 5th January 1886.

² Presidential Address to the Philosophical Institute of Canterbury, N. Z., 1st November 1883.

³ Volcanic Activity on the Islands near the North-East Coast of New Guinea, &c. *Proc. Linn. Soc. N. S. Wales*, 1885, ix. pt. 4, p. 963.

⁴ *Ibid.*, p. 988.

⁵ Professor K. Martin, of Leyden University, has published a paper entitled, *Eine Tertiärformation von Neu-Guinea und benachbarten Inseln* (*Samml. Geol. Reichs-Mus. Leiden*, 1881, i. pp. 65–83, t. 3), in which a Tertiary species of *Alveolina* is described. A general geological summary regarding New Guinea is also given.

out by the Royal Geographical Society of Australia,¹ a few fossils were obtained which next claim our attention. From the head of the Strickland River an olive-green mudstone was obtained, full of comminuted marine fossils, chiefly mollusca. The lithological character of the matrix points to a volcanic origin. None of the species were nameable.

From the first foot-hills of the Upper Strickland River a block of fine sandstone containing *Pecten* was obtained. This Mr. A. J. Vogan, who was attached to the expedition, informed me was *in situ*. The shells are too much worn by weathering to attempt a specific determination, but they seem to have more of a Tertiary than a Secondary aspect.

At Observatory Bend, Strickland River, numerous travelled nodules and small boulders were collected, revealing a totally different kind of life, chiefly the remains of Ammonites. But amongst them is a bivalve, either an *Aucella* or an *Inoceramus*. If the latter, it is decidedly of the type of the Cretaceous *I. concentricus*. Unfortunately, the characters of the hinge cannot be ascertained. These fossils are, however, of little importance when compared with the Ammonites. Out of a number of nodules, in which the fossils are indicated by impressions of casts, a fairly representative series has been selected, containing four more or less recognisable species, or at any rate species which can be referred to one or other of the sections into which the old genus *Ammonites* is now broken up, and the facies of which is sufficiently clear for broad generalisation.

The section *Stephanoceras* is largely represented by an Ammonite of the group of *A. calloviensis*, Sby. (fig. 5), and even closely allied to that species. At first sight the primary costæ springing from the umbilical margin are not very apparent in our specimens, but attentive examination reveals them as in D'Orbigny's figure² of this species, but closer together, and therefore more numerous. It would also appear that the umbilicus is smaller than in the European form, and less telescopic, wherein these shells approach *Stephanoceras transiens*, Waagen,³ from Kutch, or *S. maya*, J. [de C. Sby.⁴ They possess the same form and arrangement of ribs as in the latter, which commence quite simple at the umbilicus, and break up at about equal distances into bundles of three, whilst the shell is rather more compressed.

The next species partakes of the form of *Stephanoceras blagdeni*, J. Sby. (fig. 2), or equally well with *S. coronatus*, Brug. It is a small shell, with the costæ of the back and the tubercles less marked than in the above species. On the other hand, the cross-section of the whorls clearly indicates its relation to this group. The specimen also partakes, in some degree, of the features of the shell figured by D'Orbigny as *Ammonites humphresianus*,⁵ but the umbi-

¹ Special Record of the Arrangements for the Exploration of New Guinea. *Proc. Geograph. Soc. Australasia*. Special vol., 1885, p. 157.

² *Pal. Franç. Terr. Jur.*, Ceph. I. Atlas, tom. 162, f. 10.

³ *Pal. Indica*, Jurassic Fauna of Kutch, I. Ceph., tom. 32, f. 2a.

⁴ *Trans. Geol. Soc.*, V. (2), tom. 61, f. 8.

⁵ *Pal. Franç. Ter. Jur.*, Ceph. I. Atlas, tom. 134.

licus in the former is deeper. A comparison may also be made with Quenstedt's figure of *S. coronatus*.¹

Two rather well-marked Ammonites (figs. 1 and 3) appertain to the group of *Stephanoceras lamellosum*, J. de C. Sowerby,² but, as compared with that species, possess a wider and more open umbilicus, with the costæ of the back less upwardly curved and more horizontal; in fact, the costæ are all more direct and lack the sigmoidal curve on the flanks of *S. lamellosus*. From *S. grantianum*, Oppel, as figured by Waagen, the costæ seems to be finer, but to J. de C. Sowerby's figure of this species, under the name of *A. harveyi*,³ our fossils bear a close resemblance, and also to D'Orbigny's figure⁴ of the same, in the breadth and nature of the back. An affinity is also to be detected with the same author's *Ammonites macrocephalus*,⁵ but not with that of Waagen, under the same name. A third fragment, however, possesses costæ quite as coarse as those shown in the latter's illustration of *Stephanoceras grantianum*.

Yet another Ammonite (fig. 4), which Dr. H. Woodward, who was kind enough to examine casts of all these fossils sent to him by myself,—compares to *A. lingulatus*, Quenst., of the White Jura. Figures of this species are not accessible to me, and I cannot find anything precisely like it, although it seems to be of the Upper Oolite type of *A. lamberti*, Sby., and *A. sutherlandiæ*, Sby., as figured by D'Orbigny,⁶ in so far as the break in the double costation goes, but the back of our shell is much too broad, and the costæ too fine. The square back, with its oblique costæ, and the marginal crenulations, all convey to this shell a much more Upper Oolite or Lower Cretaceous aspect than they give to it a Lower Oolite facies. Neither is it impossible that a relation may exist between it and *A. leai*, Forbes.⁷

So far as our present knowledge of Queensland Ammonites exists, there is no connection between the latter and either of the species described above, although our Pl. XXIX., figs. 1 and 3, bear some resemblance to Moore's *Ammonites macrocephalus*⁸ from Western Australia.

The only other organic remains so far brought from New Guinea were obtained by Mr. Theodore Bevan during his fifth and last exploring expedition along the south coast of the island in 1888.⁹ These consisted of a few shells from the Aird Hills, Douglas River, and were determined by Mr. J. Brazier and the writer. They were obtained from an earthy mould or silty mud, and cannot be geologically of any great age, but are of considerable interest from the position of the deposit containing them. This is described by Mr. Bevan in the following words:—"The term Aird Hills describes an island of probably moderately recent upheaval, on which a cluster of volcanic cones, some ten in

¹ Cephalopoden, 1849, Atlas, tom. 14, f. 4a.

² Trans. Geol. Soc., V. (2), tom. 23, f. 8.

³ Ibid., V. (2), tom. 23, f. 5.

⁴ Pal. Franç. Ter. Jur., Ceph. I. Atlas, tom. 150.

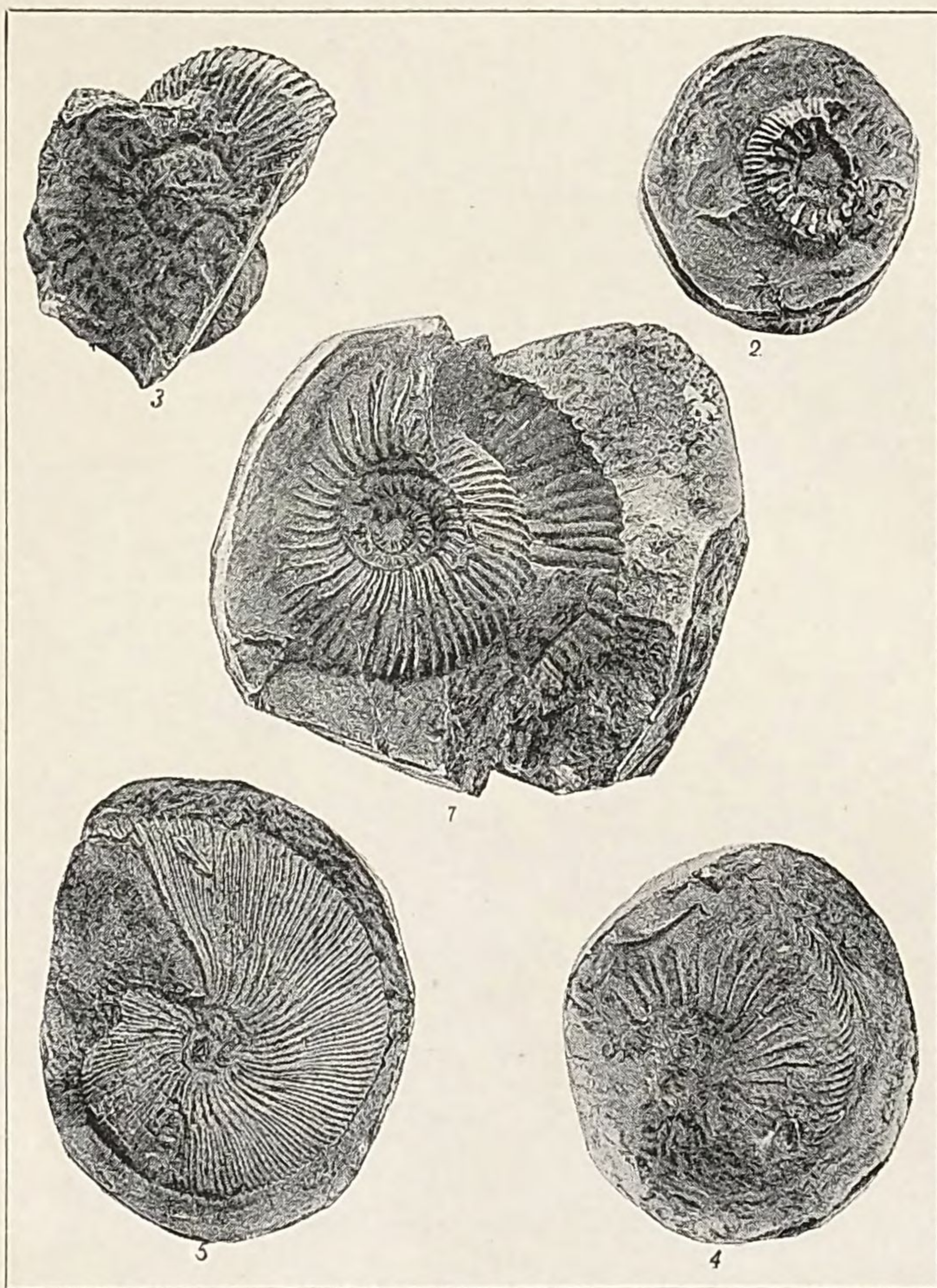
⁵ Ibid., tom. 151.

⁶ Ibid., tom. 177.

⁷ Quart. Journ. Geol. Soc., I. p. 178, tom. 12, a and b.

⁸ Ibid., xxvi. tom. 15, f. 5.

⁹ Mr. Theodore F. Bevan's fifth expedition to British New Guinea, 1888, p. 21 (8vo, Sydney, Government Printer).



NEW GUINEA FOSSILS.

- Fig. 1. *Stephanoceras* allied to *S. lamellosus*, J. de C. Sowerby ; Strickland River.
- Fig. 2. *Stephanoceras* allied to *S. blagdeni*, J. Sowerby ; Strickland River.
- Fig. 3. *Stephanoceras* allied to *S. lamellosus*, J. de C. Sowerby ; Strickland River.
- Fig. 4. An ammonite allied to *Ammonites lingulatus*, Quenstedt, teste H. Woodward ; Strickland River.
- Fig. 5. *Stephanoceras* allied to *S. calloviensis*, Sowerby ; Strickland River.

(The figures, from photographs by Mr. H. Barnes of the Australian Museum, are reduced nearly one-third.)

number, and covering an area of about five square miles, are surrounded by deep navigable channels of fresh water. . . . The general formation of these trachyte hills is a volcanic tuff. The summit of this particular cone, however, is covered with a deposit of semi-fossilised fluviatile shells contained in an earthy mould or silty mud." The species determined were the following :—

Melania clava, Lamarck.—This species is represented by several examples.

It is found in the living state at New Ireland and at the Philippines ; it was also obtained by Mr. John Brazier in the Solomon Islands.

Neritina gagates, Lamarck, comprises more than two-thirds the entire collection, and is present in several varieties. It is a characteristic New Guinea species, and was found by Mr. Brazier in the Katau River.

Cyrena sp.—Several valves, which cannot exactly be referred to any known species from New Guinea. They approach nearest to *Cyrena nitida*, Deshayes, from Borneo, and are perhaps only a variety of it.

The collection of the Queensland Geological Survey has been enriched by the presentation by Mr. E. Edelfelt of specimens of brown or yellow marl from Maiva Village, found at a height of about two hundred feet above sea-level. The marl has plentifully scattered through it the remains of small shells in the form of internal casts, and a few fragmentary corals. By the kind permission of my co-writer, Mr. R. L. Jack, the following extract from our forthcoming work on the "Geology and Palæontology of Queensland" may be appropriately inserted here :—

"The most striking of the corals is a species of *Alveopora*, allied to those described by Dr. A. E. Reuss, from the Tertiary beds of the Tiji-Lanang Valley, Rongga District, Java.¹ The trabecular septa are strong and spine-like, much curved, and six, or perhaps more, in a cycle. They have this peculiarity, that they appear to be developed in pairs, a character to some extent seen in Reuss' specimens, but in the present fossils carried to a much higher degree. The spurious columella formed by the union of the septa is of the slightest construction. In the character of the septa this coral appears to be most nearly allied to *Alveopora brevispina*, Reuss,² but in other features to *A. hystrix*, Reuss.³ If the paired condition of the septa, here so very marked, is a constant and definite character, and it appears to be so, it will at once distinguish this coral from all those described by Dr. Reuss.

"The largest and best preserved coral is a species of *Leptoria*, a genus not met with either by Reuss, amongst the Javan corals, nor by Professor K. von Fritsch,⁴ amongst those collected in Borneo by Mr. R. D. M. Verbeek. On the other hand, Professor K. Martin, of Leyden,⁵ describes an allied genus *Cæloria*, from the former country. The characters of the New Guinea *Leptoria*, as portrayed in the single specimen, are not

¹ *Ueber fossile Korallen von der Insel Java. Reise Osterr. Fregatte "Novarra,"* 1851-59. Geol. Theil, II. Band, 2 Abth., p. 165.

² *Loc. cit.*, tom. 3, f. 7, a-c.

³ *Ibid.*, tom. 3, f. 8, a-c.

⁴ *Fossile Korallen der Nummulitenschichten von Borneo. Palæontographica*, 1878, Suppl. Band III., Leif. 1, Heft 3, p. 93.

⁵ *Die Tertiärschichten auf Java*, 2 Theil, p. 137 (folio, Leyden, 1880).

sufficiently clear for specific description, and make one long for further materials. *Leptoria* is extensively distributed in the Indian and Pacific Oceans.

"Next in order is a well-marked *Galaxea*, again only a fragment, but clearly not far removed from the recent *G. clavus*. The corallum, as preserved, is split in half longitudinally, and exhibits several corallites radiating outwards, surrounded by a copious peritheca.

"The last to be noted, but certainly not the least important, are two examples, fragmentary unfortunately, of the interesting genus *Deltocyathus*, distinct both from the Tertiary and recent species *D. italicus*, Ed. and H., and the recent *D. magnificus*, Moseley. The occurrence of this genus in these New Guinea beds is of the highest interest, following as it does upon its discovery by the *Challenger* Expedition in the Pacific.¹

"The material presented by Mr. Edelfeldt to the Queensland Survey Collection is of too limited a nature to permit any definite statement to be made as to the age of the beds, but they are either younger Miocene or Pliocene, probably the latter. The Javan series described by both Reuss and himself are considered by Professor K. Martin to be of Miocene age."²

Such is a brief outline of the Palæontology of New Guinea, so far as it is known to the writer. Briefly reviewing these facts, it is manifest that the oldest fossiliferous rocks on this island-continent, of which we at present have any record, probably correspond homotaxically with the Upper Oolites of other countries, more particularly the European, at the same time displaying some relation to the Indian beds of the same age. As regards the *Inoceramus*, it would appear to resemble an old-world Cretaceous species; but the specimen being a single one, too much stress must not be laid upon this point. It may simply be said that Cretaceous rocks put in a claim for consideration.

Of the Tertiary fossils it is necessary to speak more fully, but with caution. The presence of *Voluta macroptera* and *V. anticingulata* in the Yule Island deposit would go a long way towards correlating the latter with the beds containing these shells at Schnapper Point and Muddy Creek in Victoria, as suggested by Mr. C. S. Wilkinson. I am indebted to the kindness of Prof. W. T. Stephens, M.A., for an opportunity of examining the Yule Island collection in the Macleay Museum,³ but the species mentioned were not observed there, and only those described by the Rev. Mr. Woods came under observation. An attentive examination of these rather leads me to accept Mr. Woods' suggestions as to the age of the fossils in question. The matrix is also clearly the same as that containing the corals collected by Mr. Edelfeldt at Maiva village.⁴

The urchin described as *Temnechinus* does not appear to belong to that genus, as defined by its originator, Edward Forbes,⁵ and at the present moment I am

¹ "Report on certain Hydroid, Alcyonarian, and Madreporarian Corals," &c., by Prof. Moseley—*Voy. "Challenger."* Zoology, vol. ii., 1881, pp. 147 and 148.

² *Loc. cit.*, 2 Theil, p. 38.

³ The fossils were collected by Mr. Brazier.

⁴ Specimens are in the Mining and Geological Museum, as well as in the Queensland Survey Collection.

⁵ *Mon. Echinodermata Brit. Tertiaries*, 1852, p. 5. The New Guinea fossil does not possess the typical excavations along the sutural margins of the plates seen in all true

not prepared to generically place the specimen. It may probably be an undescribed form.

The *Peronella* would appear to be a small individual of the characteristic and generally distributed Australian species to which Mr. Woods has referred it. The specimen of *Dolium costatum*, although only an internal cast, is one of so strongly and distinctly marked a species as to be readily recognisable from the other Australasian forms. The simple and distant costæ and canaliculate suture distinguish it at once. The *Pecten novæ-guinæ* is not identical, says Mr. Brazier, with any existing species in neighbouring waters, and must therefore be regarded, with the so-called *Temnechinus*, as peculiar to the Yule Island deposit. It is, however, remarkably like a South American *Pecten* described by D'Orbigny from the Tertiary rocks of Patagonia as *P. paranensis*.¹ In addition to the species just mentioned, I detected in one of the blocks of the Macleay collection the internal cast of a *Strombus*, which Mr. Brazier regards as that of *S. (Gallinula) campbelli*, Gray, a species now living in the Australian seas.

NOTE UPON SAMPLES OF HOT SPRING WATER, FERGUSSON ISLAND, BRITISH NEW GUINEA, PROCURED BY SIR WILLIAM MACGREGOR, K.C.M.G.²

There were four samples in all. No. 1, labelled "Seymour Bay, Fergusson Island, 11-11-88. Boiling water from hot springs."

This sample was contained in a soda-water bottle, and as one-half of it consisted of solid matter, it would be more correctly described as a mud.

The sediment or solid matter was of a bluish-grey colour, and was found to contain a few distom frustules or calcium sulphate and a good deal of sulphur. At some future time it is intended to make a more complete examination of this mineral matter.

The sulphur was tested for selenium, but none was found to be present. Neither did this residue contain arsenic or phosphorus.

The supernatant liquid was filtered off from the mud, after allowing the specimen to stand for two or three days; the filtrate had a strong smell of sulphurous acid, and strongly reddened blue litmus paper, showing the presence

forms of *Temnechinus*, nor are the ambulacral plates confluent. These characters are emphasised by Forbes, and accepted by A. Agassiz in his Revision.

¹ See Darwin's "Geol. Obs. Volc. Islands and Pts. of S. America,"—*Voy. "Beagle,"* 2nd edit., 1876, tom. 3, f. 30. In *P. paranensis*, each costa, as in the New Guinea species, is divided into three or four ribs. The concentric laminæ in the latter are continuous over the costæ and intervening valleys, forming frills, but in the former the ribs of the costæ are separately decorated by concentric lines of projecting tooth-like spines. The interior ear also in the South American form is more deeply divided than in our species, and the posterior is less granulate.

² By Professor Liversidge, M.A., F.R.S., &c., to whom the author is indebted for this valuable contribution.

of free acid, and on exposure to the air soon became milky from the separation of sulphur.

On evaporating the filtrate down to dryness in a platinum dish over a water bath, a pale brownish residue was left, which rapidly absorbed moisture ; on ignition, it intermixed strongly and gave off white acid fumes (of sulphur trioxide), the ignited residue being yellow when hot, and brown when cold. The weighings gave—

Loss on ignition	.	.	.	9.63 pt. per 1000
Fixed solids	.	.	.	4.47 „
Total solids	.	.	.	14.10 „

The chlorine was not determined in this sample. The fixed solids left on ignition were found to contain both soluble and insoluble silica, sufficient of the former to gelatinise with hydrochloric acid ; much iron, mainly present in the original water, in a ferreous condition, some magnesia, lime, and a considerable quantity of sodium chloride ; lithium was sought for, but no indication of it was obtained, although the other three samples gave the lithium band most readily.

Sample No. 2, labelled “ Hot Springs, Seymour Bay, 11-11-88. Water after boiling.” Contained in an ordinary pickle bottle.

This also showed a large amount of a powdery yellow sediment, about 10 per cent. perhaps, which consisted mainly of free sulphur.

The water contained a good deal of sulphuric acid, and on evaporating down to dryness over a water bath, the residue blackened from the action of the free sulphuric acid upon the organic matter present ; on ignition, copious fumes of sulphur trioxide were evolved. Much gelatinous silica was left, together with iron, lime, magnesia, and soda ; this residue showed a well-marked lithium band.

The iron was present in the original water, mainly in the ferreous state.

Loss on ignition	.	.	.	1.274 per 1000
Fixed solids	.	.	.	3.630 „
Total solids	.	.	.	4.904 „
Chlorine	.	.	.	1.240 „

Sample No. 3, labelled “ Seymour Bay, 11-11-88. Boiling water from small spring.” Contained in a soda-water bottle.

This, like No. 2, contained a yellow powdery sediment of sulphur and other matters ; it possessed a strong acid reaction, and gave off a smell of sulphurous acid, together with that of sulphuretted hydrogen.

On evaporating down to dryness, a light-coloured residue was left, brown in the centre, and, on ignition, this blackened considerably, but only gave off a small quantity of sulphur trioxide fumes : the salts present were the same as in No. 2, and the lithium band was equally well marked.

Loss on ignition	.	.	.	0.630 per 1000
Fixed solids	.	.	.	2.470 „
Total solids	.	.	.	3.100 „
Chlorine	.	.	.	0.730 „

Sample No. 4, labelled "Seymour Bay, 11-11-88. Water from lagoon, hot springs saline lake. Margin surrounded by sulphur." Contained in a wine bottle.

The sediment from this was but small in amount and of a dark-brown colour; there was also a little black flocculent matter.

The water possessed a strong acid reaction and smell of sulphuretted hydrogen.

On evaporating down to dryness, a large quantity of iron was found to be present, mostly in the ferreous condition; much gelatinous silica, some lime, magnesia, and soda, together with lithium. On ignition, the residue became intensely black, gave off slight fumes with an acid reaction, and decrepitated (from sodium chloride crystals) and left a dark ferruginous-looking residue.

Loss on ignition	2.110 per 1000
Fixed solids	5.470 „
Total solids	7.580 „
Chlorine	1.390 „

These waters present the usual characters of hot spring waters, occurring under similar conditions, and require no special comment, except as to the presence of lithium, and I regret that none of the samples were sufficient to allow the amount of this element to be estimated; but perhaps on some future occasion it may be possible to bring away a larger supply of the water, or in default of that, the residue left by the careful evaporation on the spot of a fair quantity of the water.

Lithium was formerly regarded as a very rare element, but the spectroscope shows that, although it only occurs in small quantities, it is one of the most widely distributed elements, and is found in many minerals, rocks, soils, and in the ashes of numerous plants.

It may prove to be present in these waters in sufficient quantity to render them useful at some future time either for medicinal or other purposes.

II.

SUCCINCT GENERAL NOTES ON THE FLORA OF BRITISH NEW GUINEA.

By BARON VON MUELLER, K.C.M.G., M.D., Ph.D., F.R.S., &c.

IN endeavouring to respond to a request from the accomplished Hon. Secretary of the Queensland Branch of the Royal Geographical Society of Australasia to furnish for his forthcoming valuable work on British New Guinea some few pages explanatory of the flora of that Dominion, it became obvious that such a sketch can be but very imperfect, not only in consequence of limited literary space, but also on account of our as yet very partial acquaintance with the vegetation of any portion of the great Papuan island. There are, however, reasons to suppose that the total of the vascular plant species of New Guinea will not fall short of 4000, of which by far the greater proportion is likely to occur also in the British Possessions there; but as yet we know from the whole main island and the adjoining islets only about 1500 Vasculares of firm specific standing as indigenous there. In the coast tracts and in the lower mountain regions the vegetation is, to a vast extent, identical with plants of South Asia and Polynesia, while much of this complex of vegetative specific forms extends to the shore-region of Tropical Australia also. It is therefore unnecessary to burden this brief treatise with any enumeration of plants so well known and so widely distributed, detailed notices of them being indeed beyond the scope of these pages. If anything should be singled out from this coast or lowlands vegetation for special mentioning as peculiarly conspicuous or otherwise very remarkable, it would be the Cocos and Nipa palm, various Mangrove trees, several Barringtonias, *Melaleuca leucadendron* (the anti-malarian Cajaput tree), occasionally Callistemon-like, with brilliantly crimson flowers (filaments), *Casuarina littorea* or *equisetifolia*, *Excæcaria agallocha* (the Blinding tree), *Lagerstroemia Reginae*, *Canavallia obtusifolia*, an enticing but deleterious Bean, species of *Myrmecodia* and *Hydnophytum*, with their normally ant-harbours enlarged stems or roots.

The number of indigenous plants from New Guinea, hitherto known as absolutely identical with species otherwise restricted to Australia, is comparatively limited, but comprise some very typical forms; so much so as to impress an Australian feature on some of the landscapes. They belong to the following genera:—For the lowlands, *Tetracera*, *Eupomatia*, *Drosera*, *Hearnia*, *Halfordia*, *Rhus*, *Muehlenbeckia*, *Pimelea*, *Acacia* (phyllodinous species), *Albizzia*, *Kennedya*, *Eucalyptus*, *Leptospermum*, *Melaleuca*, *Tristania*, *Metrosideros*, *Fenzlia*, *Panax*, *Banksia*, *Grevillea*, *Modecca*, *Wedelia*, *Alyxia*, *Mitrasacme*, *Plectranthus*, *Josephinia*, *Faradaya*, *Clerodendron*, *Hæmodorum*, *Hypoxis*, *Arthropodium*, *Geitono-*

plesium, *Schænus*, *Gahnia*, *Andropogon*, *Eriachne*, and *Leptaspis*. For the highlands, *Styphelia*, *Epilobium*, *Galium*, *Myosotis*, *Euphrasia*, *Araucaria*, *Libertia*, *Astelia*, *Uncinia*, *Carpha*, *Agrostis*, *Danthonia*, and *Dawsonia*, the last mentioned a moss of large dimensions. *Evasculares* otherwise have not been alluded to thus far. Some of these upland plants extend to New Zealand also. Besides all these, not known to be represented by identical specific forms beyond the Australian Dominions, occur species of the genera *Flindersia*, *Brachychiton*, *Olearia*, *Vittadinia*, and *Phyllocladus*, in congeners closely allied to those endemic here, while *Passiflora aurantia*, *Notothixos subaureus*, *Xerotes banksii*, *Smilax australis*, and *Carex fissilis* hail also from New Caledonia ; whereas *Drimys*, *Drapetes*, and *Libocedrus* reach in different forms also the cooler regions of America ; only two of them, with *Phyllocladus*, being con-specific with plants from Kini-Balu in Borneo. Our knowledge of the Alpine Flora of New Guinea rests hitherto on the scientific zeal displayed during his famous ascent of the Owen Stanley Ranges by Sir William MacGregor. We have thus learnt of the extraordinary comigration of various plants from the southern extremes of America, particularly from the Alps of Continental Australia and New Zealand, from the Himalayas, and even of some from the colder regions of Europe, among the latter being the Dandelion, *Scirpus cæspitosus*, several grasses, lycopods, and ferns.

The ascent of Mount Yule, at present under progress through arrangements by Sir William MacGregor with the Royal Geographical Society of Australia, may disclose to us ere long additional treasures of the Papuan highland flora, possibly marked by the discovery of representatives of even such genera as *Thalictrum*, *Myrica*, *Parnassia*, *Pimpinella*, *Viburnum*, *Valeriana*, *Swertia*, *Pedicularis*, *Pinguicula*, and others familiar to us from the colder regions of our European home-countries, since they occur also on the Alps of India, and in some instances on the highest culminations in the Sunda Islands, though not extending, with one exception, to the southern hemisphere elsewhere. But the most impressive feature in the highlands of the great Papuan islands, as hitherto ascertained, is that of the Rhododendrons and Vacciniums, represented as regards the latter by the large red-flowering species of the section *Agapetes*. Among Rhododendrons the most magnificent is *R. Toverenæ*, but some of the congeners descend also in New Guinea to warm regions as in Southern Asia.

Some other curious facts have come to notice from New Guinea in reference to the geography of plants ; thus, out of the half hundred wild species by which the splendid and easily hybridised orchid genus *Cypripedium*, or Lady's Slipper, is widely represented through the northern hemisphere, few only pass to Java and New Guinea, somewhat beyond the Equator, and in the latter island the genus has the farthest southern outposts in *C. glanduliferum* and *C. Rothschildi*, a somewhat unexpected result, as no species has been detected even in North-Eastern Queensland, while the genera *Impatiens*, *Eurya*, *Begonia*, *Æschynanthus*, *Buddlea*, *Gnetum*, *Equisetum*, *Quercus* are unrepresented, although evergreen true Oaks make their appearance already at comparatively low elevations in New Guinea. *Voa-canga*, *Ourouparia*, and *Cyrtandra* have recently been met with also in Northern Queensland, likewise *Medinilla* and the gorgeous *Tapeinochilus*, the latter doubt-

less destined to become permanently an ornament of home-conservatories. Of Pitcher-plants (*Nepenthes*), as yet two are known as Papuan, but the highly decorous *Freycinetia insignis* is an inmate also of forests on the Daintree River, and a tall cactus-like Euphorbia (*E. Macgregorii*) was discovered on St. Aignan's Island. The grand *Hibiscus Albertisii* is more allied to a congener from the Antilles than closely related to any of the numerous tropical Asiatic or Australian species. Of the several Mucuna Lianas all travellers speak in raptures; many other beautiful climbers occur belonging to *Ipomœa*, *Tecoma*, *Hoya*, *Trichosanthes*, and some other genera. Twice as many kinds of Palms, among them the Betel Palm and some Rattan Climbers, are known already as Papuan, as are recorded from the whole of Australia. The same may be said of Bamboos, of the genus *Ficus*, as well as perhaps the Ferns; and finally, a similar result of richness is likely to be obtained as regards epiphytal Orchids, one of the most superb of which is the Phalænopsis-like *Dendrobium Johnsoniæ*, although Australia, especially in its extreme eastern tracts, is in all these respects also by no means poor. But in this exuberance of ferns only a small share is absolutely endemic. One of the fern-trees (*Cyathea macgregorii*), strange to say, is sub-alpine only.

Of the dreaded Nettle-trees (*Laportea*), one at least is to be met in British New Guinea. Very conspicuous in their vegetation, there are also several tall species of Cycas, one of these similar to the Australian *C. media*, another closely allied to the Indian *C. circinalis*. Similarly impressive are also some kinds of Pandanus, vernacularly but inaptly called Screw-Pines, the largest of these being identical with a species from the Marianes Islands. The great genus Eugenia, so amply stretching through all the warmer zones of our planet, counts also many species as conspicuous trees, some perhaps with edible fruits in the Papuan island.

In our present state of knowledge as regards the vegetation of New Guinea, we can only as yet discuss in a very limited way the special utilitarian value of the Papuan Flora, endemic as it is to a considerable extent, particularly in its wooded vegetation throughout the mountain regions, and therefore largely not open to direct comparison. Foremost, however, are the timber resources. Successive shiploads of cedar, or rather cedrel-wood, similar to that of Singapore, have arrived at, and have been advantageously disposed of, in Australian ports. Teak is recorded from Dutch New Guinea, and may occur also in the British territory. The various species of Nageia (*Podocarpus*) should yield highly valuable pine-timber, at all events for local purposes; so also the Araucaria, though that would not be equally accessible. Where such a multitude of distinct kinds of trees constitute the bulk of the forests, and where only exceptionally gregarious species form the timber-woods, there, by necessity, can the respective value of each kind of tree be ascertained only after successive special tests. With much facility for water-carriage, undoubtedly many of these Papuan trees will soon become sought for distinct technic purposes. As regards Papuan food-plants, the Sago-Palm, long known from there, holds a rank disputed only by the Cocos-Palm. Tacca yields the so-called Fijian Aru-root. Though sugar-cane and bananas are from introduced plants extensively cultivated by the Autochthones, it is quite within the range of possibility that the spontaneous cane and the

wild *Musa*, of which Mikluho Maclay recorded already two species, may likewise finally be brought, by horticultural processes, into utility. The Green Gram (*Phaseolus Max*) extends in a wild state to New Guinea; so seemingly also the far more important rice and a *Dioscorea* yam. The magnificent *Nelumbo* Water-lily, of ancient fame, may also be counted among food-plants, the stalks serving as kitchen-vegetable, and the copious palatable seeds almost as almonds. From the few isolated places in the island which the *Nelumbo* naturally occupies, it could readily, by human action, be transferred to almost any other waters in the island. The three other indigenous water-lilies, though hardly food-plants, are *Nymphaea Lotus*, *N. stellata*, and *N. gigantea*. As yielding fruits, somewhat comparable to raspberries, should be mentioned *Rubus rosifolius* and *R. moluccanus*, while in the sub-alpine region the *Rubus Macgregori* exists with the habit of a strawberry plant. *A. Ziziphus* and several species of *Vitis* may perhaps yield esculent berries, or be capable of cultural improvements. As Papuan table-fruits can be added *Ilippe Cocco*, *I. maclayana*, *I. Erskineana*, the latter particularly luscious. The Candlenut-tree, *Aleurites triloba*, is an inmate also of Papuan forests. As condiment plants might be mentioned Ginger, marketable Nutmegs (these at least in Western New Guinea), the Massoi Laurel, perhaps a Cassia Cinnamon, the Sweet Flag of British renown (*Acorus Calamus*), a sort of Tamarisk, the Benincasa Gourd and Kawa Pepper. *Strychnos* and *Soulamea* are among the recognised medicinal plants.

About the gum, the resin, and the tan resources of New Guinea we have as yet only very little reliable information; but it may incidentally be stated that liquid amber, *Altingia*, remarkable for its fragrant resin, is known as a large tree from Dutch New Guinea. A whole host of grasses occurs, those most nutritive belonging in the lowlands to *Leptaspis*, *Centotheca*, *Eragrostis*, *Eleusine*, *Panicum*, *Paspalum*, *Oplismenus*, *Pennisetum*, *Anthistiria*, *Coix*, *Chionachne*, *Ophiurus*, *Rottboellia*, *Erianthus*, *Andropogon*, *Apluda*. It is not within the precincts of this brief essay to enter on phyto-geographic considerations as regards the Papuan island, the greater portion of which has not even been geographically explored. Opinions on extant data have been put forward that the vegetation of New Guinea must mainly be regarded as Malaynesian. Various types of this kind, however, advance also through the whole of littoral East Australia, as far south even as Gippsland, while the Alpine Flora, so far as hitherto ascertained, participates largely in that of Australia. Undoubtedly the arboreous constituents of the primeval forests are always the most typical of any flora, and thus far the vegetation of New Guinea might mainly be pronounced as Malayan, though more generically than specifically. But when we speak of the whole complex of the Papuan vegetation, it should not be forgotten that in the southern coast tracts and on the alpine heights, as mentioned already, the Australian floral element is much immixed. So far, therefore, vegetative forms of continental or insular Asia are not prevalent, and throughout most of the area an endemism of the flora has now already been proved to be conspicuous.

III.

INSECTS.

By HENRY TRYON, ASSISTANT CURATOR, QUEENSLAND MUSEUM.

I.

ORDER : COLEOPTERA.

Fam. *Cicindelidæ*.

BRITISH NEW GUINEA is very rich in tiger-beetles, the several species which occur there being individually very numerous. The student from the south will, however, miss insects belonging to the remarkable division *Megacephalidæ*, represented in Australia by species of *Megacephala* and *Tetracha*, the latter genus being also met with in the warmer parts of Africa. The extra-Australian tribe of *Collyridæ*, to which are assigned the well-known insects *Therates* and *Tricondyla*, is, however, found there. In the eastern parts of the possession *Therates labiatus*, Fabr., is most commonly met with, and at the Fly River and Hall Sound *T. basalis*, Dej. The former, which is steel-blue with violet reflections, has the labrum, mouth-organs, and legs testaceous ; the latter, a smaller insect, has the basal third of the wing-covers also light-brown. *Tricondyla aptera*, Oliv., is the only species of its genus to be met with ; it occurs everywhere. Wallace, in allusion to these insects, which he found at the Ke Islands, writes : " In the forest itself the only common and conspicuous Coleoptera were the tiger-beetles. One, *Therates labiata*, was of a purplish-black colour. . . . It was always found upon foliage, generally of broad-leaved herbaceous plants, and in damp and gloomy situations, taking frequent short flights from leaf to leaf, and preserving an erect attitude, as if always looking out for its prey. Its vicinity could be immediately ascertained, often before it was seen, by a very pleasant odour—like otto of roses—which it seemed to emit continually [D'Albertis has traced this odour to "a blackish liquid which exudes from the mouth,"—*New Guinea*, i. p. 27], which may probably be attractive to the small insects on which it feeds. The other, *Tricondyla aptera*, is one of the most curious forms in the family of the *Cicindelidæ*, and is almost exclusively confined to the Malay Islands. In shape it resembles a very large ant ; is more than an inch long, and of a purple-black colour. Like an ant, also, it is wingless, and is generally found ascending trees, passing round the trunks in a spiral direction, when approached, to avoid capture, so that it requires a sudden run and active fingers to secure a specimen."—*Malay Archipelago*, pp. 424-425.

Fam. **Carabidæ.**

This second family of the Geodephaga, or carnivorous ground-beetles, considering the position taken up by it amongst the Coleoptera of other countries, is but poorly represented in New Guinea, and especially is this so in the case of the territory included within the limits of the British Protectorate. G. Masters enumerates, in his catalogue of the known Coleoptera of New Guinea, but thirty-six species in all. This relative paucity might have been predicted by one who had successively sought for beetles of this family in different localities along the eastern seaboard of Tropical Australia, approaching New Guinea from the south. The absence of the sub-family Scaritidæ, which finds its headquarters in Australia, where it is represented by upwards of 250 species, might be explained on considerations pertaining to the predominant physical features of the country and its prevailing climatic conditions. But it is difficult to explain the almost complete non-occurrence of *Carabidæ* referable to such sub-families as Harpalidæ and Teronidæ, or even Pseudomorphidæ. This absence of certain groups of beetles and the comparative numbers of others has been commented upon by Lieut.-Col. Macleay and A. Raffray, especially by the former, who remarks (*Proc. Linn. Soc. N. S. Wales*, 2nd Ser., i. p. 136, 1886): "Of the fifteen species of *Carabidæ* [which were then under his observation] not more than two are true ground-beetles." Thus we have the Thyreopteridæ represented by no less than six species of *Catascopus*, usually brilliant glittering beetles, living under the bark of fallen trees, which, when disturbed, or when naturally coming from their hiding-places at dusk, are exceedingly difficult to capture, by reason of their great activity. The curious habit of emitting, when molested, a cloud of acrid yellow vapour from the anal orifice, which has won for an Australian beetle the popular name of "Bombardier Beetle," is manifested by *Pheropsophus papuensis*, Macl., a dull, dark-brown carabid with yellow antennæ and legs, which differs from its Australian congener in the absence of the yellow blotch on the disc of each wing-cover. This insect is not uncommonly met with, especially in the valley of the Fly. Equally numerous in individuals is *Chlænius nigripes*, Macl., first obtained by Kendal Broadbent during Stone's expedition. This latter beetle represents *Chlænius maculifer* of Australia, having, like it, an orange patch near the apex of each elytron. One of the most interesting additions to the known *Carabidæ* of British New Guinea is a species discovered by A. C. English in the St. Joseph River district, elsewhere described as *Pæcilus ornatus*, mihi. This insect, which measures half an inch in length, is dark olive-green above, with a broad, bright, green band following the outer borders of the wing-covers.

Fam. **Dytiscidæ.** Fam. **Gyrinidæ.** Fam. **Hydrophilidæ.**

The water-beetles, including those with slender antennæ, the Dytiscidæ, and the Gyrinidæ, and those with clavate antennæ—the Hydrophilidæ, are probably well represented in New Guinea. Master's catalogue gives thirteen species, distributed through the three above-mentioned families. In a small

collection of beetles, however, obtained by A. C. English from the St. Joseph River, the writer has found a like number of species, each of which is probably different from any recorded by Masters. This collection enables the genera *Sternopriscus* and *Cybister* amongst Dytiscidæ and *Hydrophilus*, *Sternolophus* and *Hydrobius* amongst Hydrophilidæ, to be now included in a conspectus of New Guinea Coleoptera. One of these additions is probably conspecific with Macleay's *Hydrophilus gayndahensis* from Southern Queensland, and the other with Hope's *Dinentes Gouldi* from the rivers of North Australia (*vid.* "Coleoptera Collected . . . in the St. Joseph River District, &c." *Second Annual Report of the Administrator on British New Guinea*. Reprint, pp. 1-2, Brisbane, 1890).

Fam. Staphylinidæ.

British New Guinea is doubtless exceedingly rich in members of this family, although not more than twenty species have as yet been recorded as occurring there. The learned botanist and traveller, Beccari, obtained as many as eighty species in a single locality—Hatam—on the north-west coast of New Guinea, which, there is reason to believe, is not exceptionally rich in this group. A. Fauvel, the well-known specialist of the Staphylinidæ, in his paper on "Les Staphylinides des Moluques et de la Nouvelle Guinée" (*Ann. Mus. Gen.*, xii., 171-313, 1878), describes no less than 139 new species and 42 new genera. Of the latter, of which number six are peculiar to New Guinea, seven are well defined. Fauvel states that New Guinea and the Moluccas constitute the centre of habitat of *Leptochirus* (16 sp.), and that the dominant tribes in this region are the *Piestinæ* and the *Staphylininæ* (*op. cit.*, p. 175). From the study of the Moluccas and New Guinea members of this extensive family, Fauvel also has found reason to differ from Dr. A. R. Wallace in the latter's conclusion regarding the position of Celebes with relation to other zoological provinces. Wallace, in fact, includes Celebes in the Austro-Malayan sub-region—that is, to the same zoological group as the Moluccas and New Guinea—but at the same time states that it is difficult to assign to it its correct position. Now, the study of the Staphylinidæ coming from these countries have brought under Fauvel's notice facts which absolutely contradict this view. D'Albertis discovered at Yule Island the cosmopolitan species *Lithocaris parvicollis*, Fauv., and on the Fly River the splendid *Actinus imperialis*, Fauv. Regarding the latter insect—the type of a new genus, the name of which is derived from ἀχτίς, the sun's ray—Fauvel informs us that it is the most brilliantly coloured of all the Staphylinidæ of New Guinea, comparable only in colour to the Paradise Birds, that it attains a length of one inch, is black, with the head and thorax above very glossy, and has green wing-covers, the extremities and sides of which are bordered with light-gold colour. No Papuan Staphylinidæ have yet been discovered as inhabitants of the nests either of ants or termites; but New Guinea presents us with two beetles of this family which are remarkable as being submarine dwellers. These are *Polypea coralli*, Fauv., and *Corallis polyporum*, Fauv., both of which Beccari met with in the sea under Polyps, at Ann Island, and in other places.

Pselaphidæ and *Scydmaenidæ*.—Messrs. Raffray and Schauf have described

many New Guinea species of these families, the beetles belonging to which, and occurring within the limits of the Protectorate, do not seem to have as yet claimed the attention of collectors.

Silphidæ.—The large *Necrodes osculans*, Vigors, a black insect with a light-red blotch on each wing-cover, which in Australia consumes the still putrid carcasses of dead cattle and dogs, was met with by D'Albertis some distance up the Fly River, feeding upon the body of a flying-fox (*Pteropus* sp.). This is the only member of the family recorded as occurring in New Guinea.

Fam. *Scaphididæ*.

D'Albertis also obtained two species of beetles belonging to this family on the Fly River. These have been described by Gestro, who has assigned to them the designations *Scaphidium cyanipenne* and *C. metallescens*, in allusion to their prevalent colours.

Fam. *Histeridæ*.

The great authority on this family, M. S. A. de Marseul, has described in *L'Abeille* and in *Annales du Museum de Genova*, the numerous species brought from New Guinea by Beccari and D'Albertis, including species obtained in British New Guinea, at Yule Island, Mount Epa, and on the Fly River. Amongst the number thus recorded are two species of *Hololepta*—the species of which, in Australia at least, frequent the decaying trunks of grass-trees (*Xanthorrhæa* sp.). There is also the usual proportion of *Saprophagous* species.

Fam. *Nitidulidæ*. Fam. *Cucujidæ*. Fam. *Dermestidæ*.

These three families also are each well represented in British New Guinea.

Fam. *Parnidæ*.

Mr. English, during an expedition to the St. Joseph River District, was so fortunate as to obtain very distinct beetles belonging to this interesting family, no member of which had been previously met with in New Guinea.

Fam. *Lucanidæ*.

The *Lucanidæ* proper, including those beetles in which the mandibles of the male sex are abnormally developed, usually designated Stag Beetles, are represented in British New Guinea by species referable to the genera *Neolamprinia*, *Cyclommatus*, *Metapodontus*, *Gnaphaloryx*, *Ægus* (3 sp.), and *Figulus* (3 sp.). The more noteworthy of these are the species of *Neolamprinia* and *Cyclommatus*. A representative of the latter genus, apparently *C. Kaupi*, Gestro, from the St. Joseph River, measuring $1\frac{1}{2}$ inch in length, is purplish-brown with the femora tinged with orange, and it has its broad flat head terminated by jaws which are as long as it and the thorax together. *Neolamprinia Gestroi*, Kirsch, is the sole recorded example of that interesting section of Australian *Lucanidæ*, which includes the well-known bright-coloured beetles which vary from golden-

green to purplish-blue—the different species of *Lamprinia*. The Passalidæ, or second division of the Pecticorn beetles, is represented by a species of *Mastochilus*. No doubt, however, other forms referable to it occur within the Protectorate.

Fam. **Copridæ.**

The dominant genus representing this group is *Onthophagus*, many species of which occur within the Protectorate, *O. consentaneus*, Harold, being one of those most commonly met with.

Fam. **Geotrupidæ.**

Species of *Trox* and *Bolboceras* illustrate this group.

Fam. **Melolonthidæ.**

Though other genera are reported as having representatives in other parts of the Great Island, *Lepidiota* is the only one of this group which is stated to occur in British New Guinea.

Fam. **Rutelidæ.**

The genus *Anomala*, and one or two others, present us with a few forms referable to this group. The student of Australian Coleoptera will, however, miss *Anoplognathus*, with its numerous species.

Fam. **Dynastidæ.**

This group is well represented, many of the members of it occurring in British New Guinea being formidable insects. A large beetle, apparently a species of *Scapornes*, occurring at Milne Bay, has two stout, flat, blunt processes, arising from the prothorax, and directed forwards and inwards. These almost meet a similar pair arising from the head.

Fam. **Cetoniidæ.**

The "Cetonias," as they are named, are beetles which, owing to their numbers and usually gay coloration, are perhaps brought prominently to the notice of every visitor to New Guinea. They are also a favourite group with all collectors of insects. Wallace, in the "Transactions of the Entomological Society for 1868," gave a very long descriptive catalogue of Cetonidæ of the Malayan Archipelago, which at that time were principally known through his labours. More recently R. Gestro has enumerated and described the fifty-five species obtained in Malacca by G. Doria, O. Beccari, and L. M. D'Albertis (*Ann. Mus. Civ. Storia Nat. Genov.*, vi. 1874, pp. 487-536), and those secured in 1875-6 by D'Albertis at Somerset, Yule Island, and the Fly River (*op. cit.*, ix. 1876-7, pp. 83-110, and xiv. 1879, pp. 5-17). This traveller informs us that he found at Naibui, Yule Island, amongst the flowers, a great many small Cetonidæ, and that never before or since he had taken to collecting insects had he obtained in one day so many beautiful species of this interesting class (*New Guinea*, i. p. 344). The most remarkable species are representatives of the genera *Lomaptera* and *Ischiopsopha*, which

form a section of Cetonidas more or less characteristic of the Papuan and Malayan regions, though not exclusively so. They are generally, however, difficult to obtain, since they frequent the tops of the higher trees, especially resorting to the flowers of *Calamus* and other palms. D'Albertis has noticed that *L. xanthopus* is attracted by the gum which exudes from a particular tree, which, however, he does not name (*New Guinea*, ii. p. 29). In this insect the wing-covers are green, bright-green, dull-green, or bronzy-green, with their apices and the margin of the thorax yellow. *Lomaptera adelpha*, Thoms., which also occurs on the Fly River, is, too, shining green, with the apical third of the elytra and the pygidium rufescent. *L. Salvadorii*, Gestro, which D'Albertis first found at Yule Island, is, again, of a beautiful brilliant green, with the disc of the elytra, nearly to the apex, copper-coloured. *Ischiopsopha ignipennis*, Gestro, and *I. Jamesi*, Waterh., are also conspicuously handsome Cetonidæ, each having a broad light-red or flame-coloured band crossing the middle of the upper surface; the general colour being dark-green, with deep azure-blue reflections. In *I. Jamesi*, the red band does not reach the extreme edge of the elytra, and therefore appears very conspicuous in its green setting. This last-mentioned beetle, which is rather more than an inch in length, and which is found from one end of the Protectorate to the other, having been obtained both on the Fly River and at Milne Bay, perpetuates the memory of Dr. James, who met with his death at the hands of the natives at Yule Island. *Anacamptorina ignipes*, Blanch., which is usually metallic-green or greenish-azure, with reddish copper-coloured legs, was obtained by D'Albertis 450 miles inland from the mouth of the Fly, presenting a somewhat remarkable variation—the elytra being almost entirely red, with a green reflection in the neighbourhood of the suture only. These are but a few of the more conspicuous Cetonidæ, but those are also handsome species which are included in *Schizorhina*, *Digenethle*, and other genera.

Fam. **Buprestidæ.**

The members of this family are the beetles which are about the first to claim the attention of the visitor to New Guinea. Over a hundred species are now known as occurring there. Of these, a small number only have been met with in British New Guinea; by far the larger proportion—comprising the beetles of this family obtained by A. R. Wallace—being known from the north-west coast. The efforts of this great naturalist account for upwards of sixty species, which have been described by H. Deyrolle in the 8th volume of the *Annales de Ent. Soc. de Belgique*. The larger and more conspicuous species are included in the genera *Chalcophora* and *Cyphogastra*. A splendid insect belonging to the former of these genera was met with by C. Hedley in 1890 at Milne Bay. This, which is allied to *C. arrogans*, Boisd., may attain a length of over $1\frac{1}{4}$ inch. It is of a brilliant golden-green colour, with coppery reflections, and has a large depression on each side of the prothorax, and four longitudinal ribs on each posteriorly serrated wing-cover. The genus *Cyphogastra*, in which the abdomen is very swollen at the base, is represented in British New Guinea by several very fine species also. As illustrations may be taken two shining-green insects, in both of which

there is a shallow depression filled with ochreous pubescence on either side of the prothorax above. These are *C. Albertisi*, Gestro, which attains a length of $1\frac{1}{3}$ inch, and *C. Macfarlani*, Waterh. In the former, which has the wing-covers smooth, the prothorax, the tips and the sides of the elytra are dark steel-blue, passing into the purple hue which more or less suffuses their entire surface. In the latter species there are two longitudinal golden-coloured grooves towards the extremities of the elytra. *C. Macfarlani* is met with from the Fly River to Milne Bay. D'Albertis met with a fine Buprestid near Ellangowan Island, on the Fly River. This (which he identified with *Stigmodera*, *Du Boulayi*) he thus describes: "Length $1\frac{1}{2}$ inch, breadth half an inch. Head green copper-coloured. Body yellow, with bars of the same colour. Wings yellow, with three bars and dark-blue spots. Under part of body copper-coloured and streaked. Antennæ and feet green."—*New Guinea*, ii. pp. 258–259.

Fam. **Eucnemidæ**. Fam. **Elateridæ**.

These allied families include a large number of British New Guinea beetles.

Fam. **Malacodermidæ**.

This family is represented by many gaily-coloured insects, the group *Lycidæ* being well developed. The members of the group *Lampridæ*—comprising the fireflies—include many species of *Luciola*, one of which, *L. Australis*, Fabr., is recorded as occurring in Australia also. There are also several *Telephoridæ*.

Fam. **Cleridæ**. Fam. **Lymexylonidæ**. Fam. **Bostrychidæ**.

Insects belonging to the first and third of the above-mentioned families may be met with. The second, *i.e.* Lymexylonidæ, is mentioned for the purpose of directing attention to two omissions in Master's "Catalogue of the Known Coleoptera of New Guinea," &c., viz. *Atractocerus bifasciatus*, Gestro, from Arn. and A. sp. . . . from Dorey. "The genus *Atractocerus*," writes Pascoe, "is one of the most remarkable amongst Coleoptera, and bears a greater resemblance to a Neuropteran than to anything else in its own Order; and yet we find this genus, one of the most specialised of its class, distributed over Africa, Madagascar, Java, the Malayas, Australia, and Brazil—in fact, over almost all parts of the world, excepting Europe."

Fam. **Tenebrionidæ**.

This family seems to be but poorly represented in British New Guinea. The commoner forms, as in Australia, are beetles illustrating different species of *Amarygmus*. Amongst handsome beetles may be mentioned two species named by H. Macleay, *Prophanes cupreipennis* and *P. sub-metallicus*, one having purplish and the other reddish copper reflections. When the collection of Tenebrionidæ in the Museo Civico of Genoa shall have been catalogued and described, no doubt this family will assume a more prominent position in the list of recorded Papuan Coleoptera, especially as it is known to comprise the heteromorous Coleoptera obtained by Beccari, D'Albertis, and others.

Fam. **Lagriidæ.**Fam. **Mordelidæ.**Fam. **Rhipidophoridæ.**Fam. **Ædemeridæ.**

These four families have each, again, representatives in British New Guinea.

Fam. **Curculionidæ.**

The representatives of this extensive family, as might be expected, contribute in very large proportions to form the coleopterine fauna of British New Guinea. Owing, too, to the nature of those considerations which regulate the distribution of species of Curculionidæ, it becomes unprofitable to study the weevils which occur within the Protectorate without reference to what is known relating to those inhabiting other portions of the Great Island, or indeed even adjacent countries, and therefore the Malay Archipelago generally. On this subject F. P. Pascoe is by far the greatest authority. The vast collections procured by A. R. Wallace in this region have been made known by the former entomologist through the Journal of the Linnean Society of London, in his "Contributions towards a Knowledge of the Curculionidæ" (*vid. op. cit.*, vols. x., xi., and xii.) and the "Annals and Magazine of Natural History" (1871). The memoir, however, which, as may be concluded from a perusal of its title only, chiefly concerns us, is his "List of the Curculionidæ of the Malay Archipelago, collected by Dr. Odoardo Beccari, L. M. D'Albertis, and others." This is contained in volume ii. of the second series of the *Annali* of the Museo Civico of Genoa, and was published in 1885. The older writers, Guérin, Blanchard, and Boisduval, and the more recent ones, Gestro, Kirsch, Thomson, and Macleay, have, in their various writings on entomology, also thrown some light on the matter under consideration. Pascoe, in his last-mentioned paper, writes: "Few Curculionidæ were known from New Guinea and the Malay Archipelago prior to the researches of Mr. Wallace in the years 1854-1862. Many of his discoveries were published by me in the Journal of the Linnean Society, and in the Annals and Magazine of Natural History, while nearly as many remain in my cabinet unnamed. . . . The Curculionidæ of New Guinea and the Malay Archipelago seem to me to belong to a different zoological region to that of Australia. The large group of Amycterinae, so common in the latter, appears to be unknown; other large groups, such as the Belinae, Leptopinae, Gonipterinae, Haplonychinae, &c., are represented by one or two species only. On the other hand, *Rhinoscapa*, *Apocyrtus*, *Coptorhynchus*, *Alcides*, the *Mnemachinae*, *Zygopinae*, *Isorhynchinae* (with numerous species in Mr. Wallace's collection), *Calandrinae*, &c., are absent or but poorly represented in Australia. Some intermingling of species, as might be expected, occurs in the Cape York Peninsula, as is shown in the collection made at Somerset" (by D'Albertis, H.T.). The species are so numerous, and present us with so many remarkable forms, that it is difficult to select a few only for notice. Amongst the Brachyderinae we meet with several large insects belonging to the genus *Rhinoscapa*, many of which measure nearly an inch in length. In the same section, too, occurs the allied genus *Eulophus*, of which *E. Bennetti* is a conspicuously handsome species. This insect, which attains a length of one inch, is cobalt-blue

coloured, with a very pronounced pattern, formed by broad intensely black glossy bands. Of these, one crosses the wing-covers behind, and from this arise five other longitudinal ones, two of which are continued forwards to the head. Pachyrhynchus is, again, a remarkable member of the Brachyderinae, the species of which genus have usually robust snouts, globose-oval, very convex, smooth bodies, and on the latter occur small patches of silver-blue scales and raised pustular bodies, which, as *P. quadri-pustulatus*, Gestro, and *P. rubro-verrucatus*, mihi, are often red-coloured. Amongst the Otiorhynchinae is the curious triangle-shaped *Apirocalus cornutus*, Pascoe, distinguished by the short broad horns which diverge from its wing-covers behind. The common *Orthorhinus cylindrirostris*, Fabr., of Eastern Australia, represents, amongst numerous other species, the Hylobiinae. Many species of the genus Alcides, belonging to the section Alcidae, also occur in British New Guinea. *A. gestroi*, Pasc., and *A. elegans*, Guer., were both obtained on the St. Joseph River by Mr. English; shining-black smooth insects, with rather long stout rostra, and with well-defined white bars on the body, the former having three of these bars radiating from the scutellum. The Cryptorhynchinae have again many representatives, some of them large insects, such as *Odosyllis ingens* from the Fly River. *Arachnopus gazella*, Boisd., is perhaps the most conspicuous of the species of its genus—a member of the Zygopinae. This insect measures about half an inch in length, has a black oval body and somewhat long legs. It possesses also a conspicuous livery, formed by narrow white longitudinal stripes, traversing both thorax and wing-covers. The section which includes the notorious grain weevils, viz., the Calandrinae, is represented not only by small insects belonging to several distinct genera, but also by very large ones referable to the genera *Rhynchophorus* and *Diathetes*, the species of which are often more or less coloured with rufous.

Fam. Scolytidæ.

The members of this family of destructive little beetles are very numerous.

Fam. Brenthidæ.

These narrow, elongated weevils are also of numerous occurrence in British New Guinea, Froggatt having obtained no less than ten species during an expedition up the Fly River. *Janthocerus papuensis*, Macl., is conspicuous amongst them for the enormous development of the eyes, which occupy the greater portion of the head. It is at the same time about the smallest species, being only two lines in length. On the other hand, we have *Phocylides Pascoei*, Macl., with its very long rostrum, measuring twenty lines in length. The genus *Leptorhynchus*, again, contains very attenuated, almost linear insects, every portion of the body being extended. *L. bicolor*, Guér., which also occurs at the Fly River, has the head, thorax, and extremity of the elytra red, the remaining portions being dark-brown. This is rather an unusual livery amongst the New Guinea Brenthidæ, the majority of which, like *Eupsalis promissa*, Pasc., have yellow longitudinal lines on a dark ground, usually reddish-brown. This last-

mentioned beetle is evidently the common species of Hall Sound ; but A. C. English also obtained there species of both *Orychodes* and *Ectocnemus*.

Fam. **Anthribidæ.**

The Malay Archipelago being that part of the world in which this family attains its greatest development (*cf.* Pascoe, *Ann. Mag. N. H.*, ser. iii. vol. iv. p. 327), it is not surprising that New Guinea should be rich in members of it also. We thus find that more species are already recorded as occurring there than are known to exist throughout the entire continent of Australia. Some of the species of *Stenocerus* attain in British New Guinea quite large dimensions.

LONGICORNIA.

Papua will doubtless prove as rich in Longicorn beetles as have other portions of the great Malay Archipelago, the insect fauna of which, as far as this family is concerned, has had so much light thrown upon it by the labours of A. R. Wallace and Francis P. Pascoe, the former having during his explorations paid special attention to this group, and the latter having made the material which Wallace brought together the subject of a special monograph (the "*Longicornia Malayana*" of this author), which was published during the years 1864-69 by the Entomological Society of London. It is needless to say that reference to this great memoir is indispensable to any one who takes upon himself the study of New Guinea Longicorns. Wallace, during his different journeys, obtained no less than a thousand species, upwards of 800 of which were regarded as new to science, and at Dorey alone he obtained ninety-five. D'Albertis and Beccari were, too, most successful in their quest of beetles belonging to this family.

Fam. **Lamiidæ.**

The species of this sub-family occurring in British New Guinea are for the most part conspicuous insects. Amongst the Lamiidæ proper, or Lamiinæ, which are especially well represented, we may instance the different species of *Batocera*, *Monochamus*, and *Gnoma*; and then, again, the division Tmesisterninæ is represented by numerous species of the well-known genera *Tmesisternus* and *Sphingnotus* amongst others. The species of *Batocera* are usually large beetles having very long scabrid or spiny antennæ, with a large spine on each side of the thorax, and a lesser one terminating the humeral angle of the elytra. *Batocera Wallacei*, a black insect clothed with ochreous pubescence, and having snow-white spots and blotches on the wing-covers, is perhaps the best known species. This beetle attains a length of eleven inches, as Pascoe also informs us—*i.e.*, measuring from the hind tarsi to the extremity of the antennæ—and these latter organs may be three times as long as the body itself. *Batocera tæna*, Thoms., is a smaller but more elegant species, the white spots on the elytra being fewer in number and more or less circular in outline. The species of *Monochamus* are, again, somewhat similar in appearance, but have smooth antennæ. They are usually clothed with a grey pubescence. In one of the most

handsome species of the genus, which has been met with at Hall Sound, the general light-grey colour of the upper surface is relieved by regularly disposed dark-brown blotches, and three longitudinal dark thoracic bands. The genus *Gnoma* is remarkable for the extreme length which the thorax attains, especially in the male, in which sex it is also proportionately constricted, with the sides incurved. The Fly River species has been identified by W. Macleay with *G. affinis*, Guér., but it is probable that the common form, which exists from one end of the Protectorate to the other, is the variable *G. giraffra*, Schreib. It is a black beetle, about an inch in length, with long antennæ and white blotches on the wing-covers. The beetles which come under the designation Tmesisterninæ are very numerous in New Guinea. They are usually parallel-sided Lamiidæ, with a distinctly margined thorax and a porrect head, as amongst the Cerambycidæ. The species are almost entirely confined to the islands lying east of Borneo and Java, but three or four occur also in Australia. R. Gestro has written a special paper on the Tmesisterninæ collected by Signor O. Beccari, L. M. D'Albertis, and E. A. A. Bruijn (*Ann. Mus. Civ. Genov.*, ix. 1876-77, pp. 139-174). One of the most noteworthy species of the genus is *T. mirabilis*, Boisd., a beetle which occurs at Milne Bay, Dinner Island, and in other parts of the Protectorate. It is a very handsome insect, attaining a length of seventeen lines, is glossy steel-blue—appearing green or brassy-green in certain lights, and is sprinkled over with white spots, which tend to arrange themselves in five transverse bands on the elytra. The brown-orange hairs which clothe the lower two-thirds of the tibiæ also form a conspicuous feature. This splendid insect, however, is, according to D'Albertis, surpassed by *T. Albertisi*, which this naturalist found near Yule Island. *T. politus*, in which the glossy dark æneous wing-covers are crossed by four broad reticulate white fasciæ, is, however, perhaps the species most commonly met with along the entire seaboard of New Guinea. *T. monticola*, Gestro, *T. hieroglyphicus*, Blanch., and *T. Froggatti*, MacL., are other species of the genus to be met also within the limits of the Protectorate.

Sub-Fam. Cerambycidæ.

Our information concerning this element in the Coleopterous fauna of British New Guinea is very scanty indeed. With the exception of the species of the genera *Xystrocera* and *Cerambyx* and a few others, the insects of this sub-family do not in New Guinea attain such large dimensions as are met with amongst the Lamiidæ and Prionidæ. They are therefore less frequently found in collections of insects from this locality. *Cerambyx ternatensis*, Fairm., is perhaps the most common amongst the larger insects, and *Clytus australis*, L. et G., amongst the smaller ones. The latter, which is a small cylindrical beetle with three yellow bands across the wing-covers, is interesting as occurring also in Australia. The same remark applies to *Callirhoe biguttata*, Don. The Phoracanthid beetle, however, which is more commonly met with in British New Guinea is *Stenocorus simplex*.

The Prionidæ are represented in British New Guinea by members of the section which Lacordaire has designated "*Prionides vrais sylvains*" only. Two species are before the writer, having been obtained during Stone's expedition.

One of these belongs to the sub-family, Remphaninae, and is about 1.8 inch in length. It is brown, with the upper surface closely clothed with fine silky pubescence. The thorax is bounded at the sides by a regular series of sharp teeth. There are also four prominent longitudinal ribs on each wing-cover. The other is referable to the sub-family Mallodontinae. This second beetle is not quite so large as the former, and is glabrous above. Its closely-punctured thorax has a few low teeth only in the outer border, and the elytra have a finely wrinkled, shining surface.

Fam. Chrysomelidæ.

New Guinea is singularly rich in the plant-eating beetles, usually designated Phytophaga. Their number and variety, as in the case of the Buprestidæ, Cetonidæ, Curculionidæ, and the Longicornia, does but reflect the heterogeneous composition of its indigenous vegetation. For a due appreciation of this fact, it is only necessary to consult the "*Phytophaga Malayana*" of Joseph S. Baly, published during the years 1865-68 in the *Transactions of the Entomological Society of London*, and forming vol. iv. of the 3rd series. This memoir deals with the families Sagridæ, Binaciidæ, Crioceridæ, Megalopidæ, Clythridæ, Chlamydæ, Cryptocephalidæ, Eumolpidæ, and Chrysomelidæ, and is for the most part confined to the insects of these families brought together by A. R. Wallace, the new species comprised in which are especially dealt with. Since the time of the publication of the "*Phytophaga Malayana*," its author has described several additional species of New Guinea insects coming within its scope, and has also dealt with the Malayan and Papuan insects comprised in the Halticidæ, Galerucidæ, and other families of the Chrysomelidæ. The Halticidæ are described in the *Transactions of the Entomological Society* for 1876, and the Galerucidæ in the 1886 volume of the same publication. During the same period, also, R. Gestro and M. Jacoby have dealt with the Phytophaga obtained in New Guinea by Beccari, D'Albertis, and others, Gestro's paper being published in the 8th volume (1876) of the *Annali del Museo Civico di Storia Naturale di Genova*, and those of Jacoby in Series i. vol. xx., 1884; in Series (2) vol. ii., 1885; vol. iv., 1886; and . . . of the *Annali* also.

Lema cyanesthis, Boisd., a beetle with blue elytra and red head and thorax, is perhaps the commonest representative of the division Crioceridæ occurring within the limits of the Protectorate. The Cryptocephalidæ are no doubt commonly to be met with there, but do not appear to have claimed the attention of collectors. The section Eumolpidæ finds an immense development, principally in species of *Rhyparida*, a genus of which Wallace obtained no less than fifty-seven new species during his travels in the Malay Archipelago. One of the commoner representatives of the Eumolpidæ in British New Guinea is *Colaspoma regularis*, Jacoby. This insect is remarkable for the great variation which it exhibits both in size and colour, being steel-blue or green with coppery reflections. British New Guinea is equally endowed with species of Chrysomelidæ. A species of *Lamprolina* before the writer, and obtained on the Fly River by W. Froggatt, is wholly glossy, has the head and thorax coral-red, and the elytra

which are traversed by a single orange band, purple steel-blue. The same naturalist obtained, on the Fly River also, a second species of the genus, in which the orange elytral band is conspicuous by its absence. These species of *Lamprolina* exceed half an inch in length. The Flea-Beetles, or Halticidæ, are also of numerous occurrence there. The Galerucidæ, again, comprise some handsome and gaily coloured insects, those which have been grouped in the genera *Oides* (*Adorium*) and *Aulacophora* being especially noteworthy in this respect. In the "Catalogue of the known Coleoptera of New Guinea" of G. Masters there are no less than 116 species of Galerucidæ mentioned as occurring in New Guinea and the adjacent islands. This number does not, however, exhaust the recorded species from New Guinea, *Aulacophora cartereti*, Guér., a beetle which is found both at Port Moresby and in Australia, being one of his more important omissions. The Hispidæ of British New Guinea, which have again been studied by Gestro (*vid. Ann. Mus. Civ.* (2), ii., 1885), are represented by species of *Monochirus* and *Onycocephala*, three species of the latter genus having been procured by D'Albertis on the Fly River. Those singular beetles the Canidæ, with a regularly rounded contour, in which two parts of the body only are usually visible from above, viz., the more or less intimately united thorax and abdomen, and in which the legs and head are hidden beneath the expanded margin of these two portions, are represented by several species in British New Guinea. As a rule they are horn-coloured, with dark brown or almost black markings above, but sometimes the colour of the markings is that which on the elytra predominates.

Fam. **Languriidæ.**

Harold (*Mitth. Münch. Ent. Ver.*, 1879, iii.) has described several species of *Languria* from New Guinea. The species most commonly met with along the south-eastern coast appears to be his species—*L. violaceipennis*—a small, elongated, glossy beetle, with coral-red head and thorax, and deep steel-blue wing-covers.

Fam. **Erotylidæ.**

This family, which has been specially studied by Crotch (*Cistula Entomologica*, xiii., 1876), includes several New Guinea species, but it is not recorded that it has any representatives in British New Guinea, though it has been not uncommonly met with in other portions of the Great Island. Master's Catalogue enumerates nine species, to which number the Rev. H. S. Gorham has recently added one, viz., *Aulacochilus moluccanus* (*P. Z. S.*, 1889, p. 618). These insects should be looked for in decaying Polypori and other corticulous fungi.

Fam. **Endomychidæ.** Fam. **Coccinellidæ.**

These usually phytophagous beetles with trimerous tarsi also occur in British New Guinea, the latter family being especially well represented. The species belonging to the latter family most commonly found are *Epilachna hæatomelæna*, Boisd., and *E. triodecemnotata*, Rich.

II.

ORDER : ORTHOPTERA.

Fam. **Forficulidæ.**

The Earwigs of British New Guinea have been especially dealt with by Mons. Dubrony, the specialist of this group; the examples of this family obtained by L. M. D'Albertis on the Fly River and Yule Island having been intrusted to him. The species enumerated or described by this author are—(1.) From Yule Island: *L. luzonica*, Dohrn., *L. grandis*, Dubr., *Forficula wallacei*, Dohrn.; Yule Island (Mount Epa), *F. albertisii*, Dubr. (2.) From the Fly River: *Apachys chartacea*, De Haan, *Labidura riparia*, Pallas, *Labia amœna*, (Staal), an insect which is also met with in Java, Celebes, and the Philippines, *Labia grandis*, Dubr., *Palyllabia gestroi*, Dubr., and *Lobophora fuscipennis*, De Haan. In addition, there occur in British New Guinea *Echinosoma westermanni*, Dohrn., and *Labidurodes robusta*, Dubr., the latter a large insect, measuring about an inch in length; also the world roamers *Lobophora morio* (Pallas), and *Forficula auricularia*, Linn.

Fam. **Blattidæ.**

We know but little of this constituent of the insect fauna of New Guinea, much less of that of the Protectorate. The cosmopolitan species of cockroaches, *Periplaneta americana*, Dej., and *P. orientalis*, Dej., have already found their way thither, and the European *Blatta livida*, Fabr., which has been met with at Aru and in Australia, is doubtless an immigrant species there also. *Epilampra fervida*, Walk., *Blatta antiqua*, Walk., and *Epilampra Keraudrenii*, Klatw., are amongst other species recorded as occurring there. In connection with this section of the insect fauna, the reader is referred to F. Walker's "Catalogue of Blattariæ in the British Museum," 1868, with its "Supplement," 1869, and to C. Brunner de Wattenwyl's *Nouveau Système des Blattaries*.

Fam. **Mantidæ.**

This family of Orthoptera is represented in British New Guinea by a great variety of forms. Their collection, however, appears to have either been comparatively neglected, or those specimens secured do not appear to have found their way into the hands of specialists in this group. The writer has not access to Dr. Staal's "System. Mant.," published in 1877; but in the portion of the "Catalogue of the Mantodea" of J. Wood-Mason, published in 1879, reference is only made to one New Guinea species, viz., *Orthodera Burmeisteri*, W.-M., from Port Moresby, a species allied to *O. ministralis*, Fabr., figured by Blanchard in the *Voyage de l'Astrolabe et la Zelee, &c.—Zoologie*, 1853. Wood-Mason also informs us that a variety, which he names "*grandis*," of his species *Hierodula* (*Rhimbodera*) *atricoxus*, occurs in Torres Straits (*Journ. As. Soc. Bengal*, vol. li. p. 31).

Fam. **Phasmidæ.**

The remarks made as to the limited extent of our knowledge of the Mantidæ of New Guinea apply with equal force to the Phasmidæ. Many different species occur within the limits of the Protectorate. One of the most remarkable forms is that presented by *Euracanthus horridus*, Boisd. This is a large wingless insect, with cylindrical body, flattened on the upper side, the sides being margined throughout its entire length by a row of small teeth. The legs are stout, with their keeled thighs, especially the hind ones, swollen. These latter have thorn-like teeth upon their under-surface, one of them being very much larger than the others. It is the male insect which is usually obtained by collectors. This often exceeds five inches in length.

Fam. **Achetidæ.**

Again, little is known of the extent to which the family of Crickets is represented in New Guinea. The writer is not acquainted with any species derived therefrom. In F. Walker's "Catalogue of Gryllidæ," 1869, we are informed that De Haan has described two species of New Guinea Platydactyli, viz., *Gryllus* (*Platydactylus*) *novæ-guinæe* and *Gryllus Gaimardi* (*vid. Verh. Nat. Gesch. Ned. Ind. Bez. Ins.*, pp. 233-234). This author himself describes *Ornebius sordidus* from Dorei. There are, however, certain insects of this family which there is little doubt have found their way to New Guinea, and which are known to have been introduced to adjacent countries. These are the world roamers *Gryllotalpila orientalis*, Burm., and *Acheta capensis*, Fabr., two typical species of mole-cricket and cricket.

Fam. **Gryllidæ.**

The slender-feelered locusts do not appear to have been to any extent collected. Montrouzier, during his visit to Woodlark Island, secured a few species which he afterwards described in the *Annales* of the Agricultural Society of Lyon; but these do not appear to have been since identified. These insects he names *Locusta bilineata*, *L. macrocephala*, and *L. pogonopoda*, *Conocephalus cristovallensis*, and *C. Thunbergi* (*cf. op. cit.*, 2nd ser., tom. vii. 1857, p. 87). Le Guillou, in the *Revue Zoologique* for 1841, further describes *Conocephalus Trondeti*, *C. Roberti*, and *Phyllophora habasqui* from New Guinea. De Haan describes and figures *Acræcia megacephala* (*cf. Ver. Nat. Gesch. Ned. Ind. Bez. Ins.*, 209). Finally, Blanchard describes and figures two other species of *Phyllophora*, viz., *P. speciosa* and *P. grandis* (*cf. Voy. Pol. Sud*). I have before me species of *Conocephalus*, *Acræcia*, *Phaneroptera*, and *Phyllophora*. The *Acræcia* is allied to *A. solida*, Walk., and is a cylindrical, glossy-brown insect, measuring two inches in length, with a small spine between the antennæ at their origin, and conspicuously netted, spotted fore-wings. The ovipositor is stout, curved, and scabre-shaped. The *Phyllophora* is bright-green, about $2\frac{1}{2}$ inches in length, and, as in other species of the genus, the prothorax is pentangular, flat, and produced backwards in the form of a triangle to beyond the middle of the

abdomen. The leaf-like wings, perpendicular in repose, meet above in a curved line. This species of *Phyllophora* (probably *P. grandis*, Blanch.) and the *Acræcia* were obtained by Froggatt on the Fly River.

Fam. **Locustidæ.**

The true Grasshoppers, collected by the different naturalists who have of late years visited British New Guinea, have not even been enumerated. It is therefore necessary to refer to the writings of the early authorities, and especially to Blanchard's work on insects in the *Voyage au Pole Sud*. The Trylaxidæ, or long-headed Grasshoppers, are represented by a variety of the common *Trylaxis nasuta*, which is met with in Europe, Africa, Asia, and Australia. Beyond the limits of British territory there occur *Trylaxis rafflesii*, Blanch. (Raffles Bay), *T. oceanicus*, Mintz. (Woodlark Island), *T. sylvaticus* (Woodlark Island). *Pyrgomorpha rosea*, Charp., or an allied species, was obtained by Froggatt on the Fly River, and De Haan has stated that *P. brachyptera*, Haan, occurs on the north-west coast. Amongst the Xiphoceridæ there are in British New Guinea a species of *Tropinotus*, and beyond its limits *Stenoxypheus variegatus*, Blanch., which F. Walker thought was possibly a *Xiphocera*. The Acrididæ are represented, according to Blanchard and De Haan, in New Guinea by species of *Oxya*, *Acridium*, and *Heteracris*. It is highly probable also that many species of the genus *Cyrtacanthacris* will also be met with there. The Œdipodidæ are represented by the well-known world roamer *Œdipoda flava*, Linn., and Blanchard reports also, as having been obtained on the north-west coast, *Œ. guineensis*, Blanch., and *Stenobothrus guineensis*, Blanch. The interesting group of Locustidæ named Tettigidæ, chiefly characterised by the large posterior development of the prothorax, is represented by *Tettix emarginata*, De Haan, *Hymenotes arcuata*, De Haan, and *Ophiotettix cygnicollis*, Walker. An insect belonging probably to the second of the above-mentioned species of Tettigidæ was collected by Froggatt on the Fly River. This grasshopper measures about two-thirds of an inch in length, and presents the following remarkable feature, viz., a prothorax which is so compressed as to form a very elevated arched keel, which extends from head to tail, overhanging each extremity.

III.

ORDER : NEUROPTERA.

Division : **Odonata.**

Fam. **Libellulidæ** and **Agrionidæ.**

The Odonata or Dragonflies, including the families Libellulidæ, are generally stated to be well represented in British New Guinea ; the different members of it do not, however, appear to have been collected, much less described. In 1878

Baron de Selsys Longchamps described in the "*Mittheilungen*" of the Dresden Museum (Heft iii. p. 289), under the title *Odonates de la Région de la Nouvelle Guinée*, a collection obtained by Meyer on the north-west coast, &c. Again, in the following year, this well-known specialist of the group wrote a further paper on the subject, entitled *Nouvelles Observations sur les Odonates* (*Annali d. Mus. Civ. Genov.*, vol. iv. 1879, pp. 287-324). This latter dealt with the material secured by L. Laglaize at Ternate and at Karons (N.G.), and by D'Albertis and Beccari at Sorong and other localities on the north-west coast of New Guinea. No species are mentioned in these memoirs as occurring in British New Guinea; we may at least expect, however, that some of the genera found in other parts of New Guinea will be met within the limits of the Protectorate also. These genera are:—(1) *Rhyothemis*; (2) *Neurothemis*; (3) *Leptothemis*; (4) *Agrionoptera*; (5) *Orthemis*; (6) *Telebasis*; (7) *Platysticta*; (8) *Tholymis*; (9) *Diplacina*; (10) *Orchistemis*; (11) *Libella*; (12) *Trithemis*; (13) *Rhynocypha*; (14) *Agriolestes*; (15) *Idiocnemis*; (16) *Onychargia*, and (17) *Pseudagrion*. Of these genera the first four include also Queensland species.

Fam. **Ephemeridæ.**

The insects of this family occurring in New Guinea have not hitherto been collected, except in the case of one noteworthy species. This is a member of the genus *Palingenia*, which, like its congeners, has the remarkable trait of forming immense swarms at certain seasons of the year. The male *Palingenia*, moreover, is mated, not in mid-air, as in the case of other *Ephemeridæ*, but upon the river amidst crowds of rivals, until he is overwhelmed by a large struggling mass of them floating down the stream like a heap of foam. The New Guinea species has been designated by the Rev. A. E. Eaton, from whose "*Monograph of Recent Ephemeridæ*" this information is derived, *P. papuana*. Sig. D'Albertis in his "*New Guinea*" (*op. cit.*, vol. ii. pp. 118-119) alludes to this insect and its curious mode of occurrence. His remarks are thus summarised by Rev. A. E. Eaton:—"On 2nd July 1876, on the Fly River, a few hours before sunset, we witnessed a strange and magnificent sight, produced by an abundance of a species of Mayfly, actively pursued by the following birds:—*Calornis metallica*, *Artamus leucopygialis*, a *Graucalus*, a *Eurystomus*, and the common white-headed osprey, *Haliastur girrenera*. Simultaneously, the insects were being preyed upon by thousands of fishes, who rushed up to seize them whenever they touched the water with their delicate wings. But so profuse was the abundance of the flies, that the ravages of all their destroyers caused no appreciable diminution in their numbers. Mile after mile, from bank to bank, the river seemed covered with them, when all at once, as if by signal, the whole of them rose up confusedly, flying aloft in a thousand different directions, producing an effect in the air like that of a heavy fall of snow; then they descended again, and the snow seemed to cover the river with a white layer. The males greatly outnumbered the females."—*Eaton, Monograph, &c.*, p. 28.

Fam. **Termitidæ.**

The Termites or White Ants are of numerous occurrence in British New Guinea, both those species which place their termitaria or ant-hills upon the ground, and those which for this purpose resort to trees, being met with. The species do not appear to have been described.

Division : **Planipennia.**Fam. **Hemerobiidæ.**

The sub-families in which the members possess narrow antennæ, and those in which the species have these organs clubbed, *i.e.*, the Myrmeleonidæ and Ascalaphidæ, are both represented in British New Guinea. As is well known, they comprise the insects usually designated Ant-Lions. They do not appear to have been to any extent collected or described.

IV.

ORDER : HYMENOPTERA.

Our knowledge of the Hymenoptera of British New Guinea is extremely limited ; for few of the naturalists who have visited it have paid any attention to this interesting Order, and though most of them have collected a few specimens, these seldom appear to have found their way into the hands of specialists, and so their names are not recorded in scientific literature. One exception at least must be made, for L. M. D'Albertis obtained many examples of hymenopterous insects both at Yule Island and in the valley of the Fly. The writer, however, is only acquainted with the results of his gatherings amongst the Formicidæ, which have been examined and reported upon by Professor Carlo Emery. Indirect light, however, is thrown upon the nature of the hymenopterous fauna of the Protectorate by the labours of the late Frederick Smith, Maindron, and others, but especially by the first-mentioned entomologist, in describing and determining the Hymenoptera of the opposite continent of Australia on the one hand, and of India and the Eastern Archipelago on the other. But in the former quarter this light is dim and uncertain, this order of insects occurring within the Tropics having been little studied. In the latter, F. Smith has been fortunate in having the extensive material procured by the great naturalist A. R. Wallace during his different journeys to work upon. Wallace, as is well known, visited the north-west coast of New Guinea, and amongst other insects secured Hymenoptera, though the special object of his visit did not necessarily embrace these insects. The reader is referred to vol. ii. (1858) and vol. xi. (1873) of the Zoological Series of the *Proceedings of the Linnean Society* for information concerning what Wallace accomplished in this direction, and to vols. v. and viii. especially for details

regarding New Guinea species. In vol. xi. of the same publication we have these investigations summarised in "A Catalogue of the Aculeate Hymenoptera and Ichneumonidæ of India and the Eastern Archipelago," by F. Smith, with interesting introductory remarks, comprising "a few superficial observations on their habits and distribution, and on the nature of the localities in which they most abound," by A. R. Wallace himself. The geographical distribution of the Hymenoptera collected by this naturalist again forms the subject-matter of a special memoir by F. Smith in vol. vii. (1869) of the *Proceedings of the Linnean Society*. Finally, M. Maindron, in his *Notes pour servir à l'Histoire des Hyménoptères de l'Archipel Indien et de la Nouvelle Guinée*, *Ann. Sc. Ent. Fr.*, (5) viii. (1878) and ix. (1879), and (6) ii. (1882), has dealt with some of the genera of fossorial Hymenoptera and Solitary Wasps. The posthumous work of Frederick Smith, entitled, "Descriptions of New Species of Hymenoptera in the Collection of the British Museum" (1879), also contains references to a few New Guinea insects.

Fam. **Formicidæ** (Ants).

British New Guinea and the Malay Archipelago, as may be concluded from the researches of A. R. Wallace, O. Beccari, and L. M. D'Albertis, are exceedingly rich in ants, and these are, moreover, very variable in kind. Those who have studied ants are aware that their habits favour their dispersal by the means ordinarily available for the distribution of insect life, and thus it has come to pass that many species are cosmopolitan. For instance, the long-mandibled stinging ant, *Odontomachus hæmatodes*, Linn., of Yule Island, is found at Sydney, in Ceylon, in Brazil, and in Rio de Janeiro. It is therefore evident that the political boundaries which traverse island-continent like New Guinea form no barrier to the passage of ant-life, and that therefore, generally speaking, the ants of British New Guinea are those of the entire Great Island. We can, therefore, regard the *Formicidæ* of the Protectorate by the light which is thrown upon them by what is recorded concerning those of New Guinea as a whole. Even this latter is a subject which has been little dealt with, but it fortunately happens that what little we do know concerning it is due to the labours of such able students of the subject as Frederick Smith and Professor C. Emery of the University of Naples. In the following notice, therefore, the former's papers in the *Journal of the Linnean Society*, and Emery's *Formiche della regione Indo-Malese e dell' Australia*, will be followed, in so far as they refer to New Guinea species.

Sub-Fam. **Formicinae**.

Tribe **Camponotidæ**.

These stingless round-backed ants, which live in rotten wood and under stones and logs, and only occasionally occupy isolated nests, the site of which is marked by a low dome-like elevation, are represented in New Guinea by: (1) *Camponotus sylvaticus*, Ol., race *mitis*, Sm.; (2) *C. subnitidus*, Mayr; (3) *C. dorycus*, Sm.; (4) *Do.*, race *coxalis*, Sm.; (5) *C. angulatus*, Sm.; (6) *C. lævissimus*, Sm.; and (7) *C. albertisi*, Emery. Of these, No. 1 has

been obtained at Yule Island, and Nos. 3 and 6 on the Fly River. *C. dorycus*, Sm., Wallace states to be apparently nocturnal, as are several other species of the genus. The thorn-backed Ants of similar habit to *Campanotus* are: (1) *Polyrachis inconspicua*, var. *insularis*, Emery; (2) *P. sculpta*, Emery; (3) *P. atropos*, Sm.; (4) *P. fervens*, Sm.; (5) *P. guerini*; (6) *P. hostilis*, Sm.; (7) *P. relucens*, Latr.; (8) *P. cinnectens*, Emery; (9) *P. sericata*, Guér.; (10) *P. sexspinosus*, Latr.; (11) *P. variolosa*, Emery; (12) *P. argentea*, Mayr; (13) *P. dives*, Sm.; (14) *P. bellicosa*, Sm.; (15) *P. rastellata*, Latr. (*P. busiris*, Sm.); (16) *P. laevior*, Rog., var. *debilis*, Emery; *P. albertisi*, Emery; *P. metella*, Sm.; *P. neptunus*, Sm. Of the species of *Polyrachis*, of which Nos. 1, 5, 8, 11, and 16 have been observed in British New Guinea, the most interesting are two of the "*Rastellata*" group, Nos. 15 and 16. These have the remarkable habit of living in small communities amongst the foliage of trees, in which they make papyraceous nests, covered with woody and other débris, between contiguous leaves or opposite sides of the same leaf folded together. On the least disturbance the glossy black ants emerge from their dwellings and move about quickly in all directions. Both species occur along the whole Queensland coast. *P. rastellata* is also met with in India. *P. sexspinosus*, Latr., as Wallace informs us, also makes a nest on the surface of a large leaf.

One of the varieties of the pale-green ants, *Ecophylla smaragdina*, Fab., so well known on the coastal belts of many tropical countries, especially those of Africa, Asia, and Australia, is commonly met with also in New Guinea. D'Albertis has noted that the trees in some places are literally covered with their curious nests. These he aptly describes as being "formed of leaves (drawn and thin) stuck together by a sort of tissue-like spider's web, and are strong enough to resist the rain and wind at most seasons." This tent-maker, the name by which the Rev. N. F. White has designated it, is justly notorious for its pugnacity and the virulence of its bite—traits too well known to the New Guinea explorer. Other Formicidæ are *Prenolepis viridula*, Nyl., *Technomyrmex melanocephalus*, Fab., *Iridomyrmex extensus*, Emery, *I. cordatus*, Sm., and *I. scrutator*, Sm.—all small insects. A peculiar interest, however, attaches to the last two, since they were both found by Beccari inhabiting the rubiaceous plant *Myrmecodia*. This peculiar habit suggests the propriety of introducing here a few remarks on the strange relation between certain species of ants and different plants,—a work which is rendered light, seeing that the learned botanist and traveller Dr. Odoardo Beccari has treated the subject so exhaustively in his great work *Malesia*, whereof vol. ii. (1884-86) is entitled *Piante Ospitatrici, Ossia Piante Formicarie della Malesia e della Papuasias*. D'Albertis has related that whilst exploring the upper waters of the Fly River, he had occasion to direct one of his party to climb a tree for the purpose of reconnoitring. An attempt was made to comply with his command, but it was discovered that the tree was infested by ants, which, on the disturbance caused by the effort to climb, appeared in such numbers as successfully to prevent his intention from being carried out. In fact, some plants are so habitually frequented by ants that the Malays have, in the names by which they have designated them, more than once made allusion to this circumstance; thus *Endospermum moluccanum*, Becc., is named "*Caju-*

sommot" (Ants' wood), and *Korthalsia wallichiaefolia* and *Myrmecodia* "*Rotan-sumut*" and "*Ruma-sumut*" (Ants' box) respectively. The occupation of the first mentioned of these plants by ants was already noticed by Rumphius in his *Herbarium Amboience*. More than this, this great botanist observed that the ants accompanied a certain condition in the plant, for he wrote concerning it: "Truncus, omnesque crassi rami nullo constat corde, sed excavati sunt, ejusque loco referti sunt plurimis magnis et nigricantibus formicis qui in una alterave parte truncum perforant et fenestras quasi formant, perambulates illum et usque ad ramorum extremum tanquam murum concavum." This was only repeating the still more interesting case of *Acacia cornigera* of Mexico, in which the swollen hollow thorns communicating with the outside by means of an orifice are tenanted by ants, or, as Hernandez wrote in 1651: "Generantur præterea nitra corniculas formicæ quædam termes fulvæ que et nigricantes." These old allusions, and the latter especially, have been lost sight of, until Beccari recently brought them to light in the interest caused by Belt's experimental demonstration that the form of the spine of the *Acacia cornigera* is influenced by the work of the ant—in fact, that ants can, in certain cases, produce, by irritating the plant tissues, a special modification of the organs in the spot selected for habitation (*Malesia*, ii. p. 55). How this is immediately brought about is yet to be discovered. Beccari writes: "Sarebbe interessante di conoscere se le formiche delle piante ospitatrici emettono degli umori caustici dalla bocca o dall' ano, o se ne trasudano dal corpora; ed in questo caso importerebbe indagare la natura del trasudamento."—*Malesia*, vol. ii. p. 211.

Beccari has also pointed out that the "*Piante ospitatrici*," as he names them, have in many cases connected with their vegetative organs certain gland-like bodies, which the ants are in the habit of visiting in quest of the food which their secretion supplies. He has also suggested that the ants may subserve the purpose of cross-fertilisation.

Reviewing the instances to which Beccari has directed attention, we find amongst New Guinea plants: (1.) *Myristica myrmecophila*, Becc., in which the stem is swollen and hollow just above the insertion of the leaves, the cavity thus formed being accessible through a fissure-like opening, having the orifice in relief, with a round mouth. This plant is frequented by ants in great numbers. (2.) *Endospermum formicarum*, Becc.—This plant has the stems constantly cavernous, and their surfaces spotted by lenticel-like marks of cicatrization, often containing orifices through which admission can be gained to the interior. It was not ascertained that these orifices were constantly present, but they occurred in parts of the plant frequented by ants, and they had the appearance of being gnawn by the mandibles of the latter. *Camponotus angulatus*, Sm., was observed to visit the glandular bodies which occur, two on the under surface of each leaf, just where the lamina and petiole of the latter unite. (3.) *Korthalsia*.—The thorny palms of this genus, which are common in the Malay Archipelago, and one species at least inhabits New Guinea, possess, amongst other distinguishing features, an appendage at the base of the leaves, which Griffith has named "Oera." These "oera" are pierced by holes, through which access may be gained to their interior. Beccari notices that, in the case of two species of this

genus *Korthalsia*, they were frequented by ants (*Camponotus* sp. and *Iridomyrmex* sp.) in such numbers, that, on being disturbed, they produced a sound, in running over the surface of the rigid "ocra," comparable to that produced by some string-instrument. (4.) *Myrmecodia*.—The plants of this genus are strange-looking epiphytes, with large irregularly globose tubers, having various ribs or crests running in different directions, and their surface covered with mamillary elevations terminating in sharp points, spines, rootlets, or filaments. The tuber, which passes into a stout stem on which ovate or rounded thick leaves arise, is intersected by numerous galleries, which communicate with one another. Several species of this interesting genus are known to occur in New Guinea. Two, *Myrmecodia albertisi*, Becc., and *M. Muelleri*, Becc., have been found near the Fly River. (5.) *Hydnophytum*.—This genus is distinguished from the last mentioned by the fact that its tubers are without the spike-like bodies, and are smooth or simply tuberculate. The stems also are branched and often lengthened out. Its tubers are also penetrated by numerous winding galleries. *Hydnophytum Albertisii* is a species found in the Fly River valley. *Myrmecodia* and *Hydnophytum*, which are included by Beccari in a special section of the large order Rubiaceæ, which he has designated *Rubiaceæ formicariceæ*, have their tubers infested by a special ant-fauna, the members of which occupy the galleries in large numbers. The ants which are known to inhabit these *Rubiaceæ formicariceæ* have been examined by Professor Emery, and are the following :—(1) *Iridomyrmex cordata*, Sm. (= *cruda*, Sm.) ; (2) *Do.*, var. *Myrmecodia*, Emery ; (3) *Iridomyrmex scrutator*, Sm. ; (4) *Pheidole megacephala*, F. ; (5) *Do.*, var. ; (6) *Pheidole Javanica*, Mayr ; (7) *Cremastogaster deformis*, Sm. ; and two other species of the last-mentioned genus. With reference to these tubers, Treub and Forbes have maintained that, in their first origin as bulbous swellings at the base of the seedling plants, they develop independently of the agency of ants, and that they are special organs proper to epiphytal plants—the galleries existing for purposes of aëration. Beccari, on the other hand, maintains that they originate and continue to increase by reason of the attacks of ants and their continued presence within the tuber, as soon as this becomes of any size. It would seem that Beccari has established the truth of his contention. He has stated the position, however, with considerable fulness, and the student is advised to resort to his memoir to fully appreciate his line of argument (*Malesia*, vol. ii. fasc. iii. pp. 188–206). It is also noted that the species of ants inhabiting the other *Piante formicariceæ* are different from those found in *Myrmecodia* and *Hydnophytum*. They comprise the following species :—(1) *Camponotus angulatus*, Sm. ; (2) *Camponotus* sp. ; (3) *Camponotus* sp. ; (4) *Coloropsis clerodendri*, Emery ; (5) *Iridomyrmex hospes*, Emery ; (6) *Id. scrutator*, Smith ; (7) *Dolichoderus bituberculatus*, Mayr ; and (8) *Cremastogaster* sp.

To resume the enumeration of the New Guinea species of Formicidæ, we may mention the occurrence of a species of *Leptomyrmex*, a genus including the long-legged nocturnal ant of Australia, *L. erythrocephalus*, and *Dolichoderus bituberculatus*, Mayr, an exceedingly active ant, which mimics in appearance more than one species of *Polyrachis*. *Formica desecta*, Sm., and *F. quadriceps*, Sm., were amongst those obtained in New Guinea by Wallace only. Of the latter, this

naturalist relates that it carries its abdomen raised up at right angles to the body, and when disturbed appears much enraged, biting with all its force for a time, but without giving much pain.

Sub-Fam. **Odontomachinæ.**

With this sub-family we commence the consideration of those ants endowed with a sting. It includes seven species referable to *Odontomachus*, a genus the members of which are remarkable for their very long mandibles, abruptly bent inwards at the tips. These are *Odontomachus hæmatodes*, Lin. ; *O. cephalotes*, Sm. ; *O. malignus*, Sm. ; *O. nigriceps*, Sm. ; *O. tyrannicus*, Sm. ; *O. animosus*, Sm. ; *O. imperator*, Emery.

Sub-Fam. **Ponerinæ.**

Professor Emery mentions the following species in his list as occurring in New Guinea, viz. :—*Lobopelta Kitteli*, Mayr,—(1) var. *lævis*, Mayr ; and (2) var. *purpurea*, Emery ; *Lobopelta diminuta*, Sm. ; *L. diminuta*, Sm., var. *læviceps* ; *Diacamma geometricum*, var. *cupreum*, Sm. ; *Platythyrea inconspicua*, Mayr ; *Ectatomma impressum*, Mayr, var. *purpureum*, Emery ; *E. araneoides*, Le Guil. ; *Amblyopone lævidens*, Emery ; *Myopopone castanea*, Sm. ; *Ponera simillima*, Sm. ; *P. nomminata*, Sm. ; and *Anomma erattica*, Sm.

Sub-Fam. **Myrmicinæ.**

These stinging ants, in which the petiole (stalk) of the abdomen is composed of two generally nodiform joints, are represented in New Guinea by the following species, viz. :—*Myrmica cæca*, Sm. ; *Myrmica diligens*, Sm. ; *Sinia punctulata*, Sm. ; *Pristomyrmex parumpunctatus*, Emery ; *Tetramorium guineense*, Sm. ; *T. papuanum*, Emery ; *T. punctiventre*, Emery ; *T. pedestre*, Sm. The ants of the last-named genus are known to be introduced from one country to another ; thus *T. guineense*, Fab., which Mayr records from localities so scattered as the Peninsula of Sinai, Manilla, Sydney, and Cuba, has been met with in English greenhouses. Other New Guinea species of this sub-family are *Vollenhovia subtilis*, var. *affinis*, Emery ; *Monomorium speculare*, Mayr ; *Pseudomyrma læviceps*, Sm. ; *Podomyrma femorata*, Sm. ; *P. basalis*, Sm. ; *P. nitida*, Sm. ; *P. albertisi*, Emery ; and *P. gracilis*, Emery. The species of the genus *Podomyrma* are found on trees, and when alarmed usually conceal themselves in the nearest crevices. They are also very slow in their movements, and are wont to tuck their abdomen under them on the approach of any disturbing influence. *Laparomyrmex Gestroi*, Emery, is the type of a new genus of ants discovered by D'Albertis on the Fly River. *Pheidole megacephala*, Fab., *P. hospes*, Sm., *P. umbenata*, Mayr, *P. singularis*, Sm., and *P. smithii*, Emery, are species of a genus the members of which are remarkable for having two classes of workers. The workers of one class have the head immensely swollen, and have been consequently termed "soldiers." *Cremastogaster tetracantha*, Emery, is one of those small ants dwelling under the bark of trees, which have acute ovate

abdomens, which, as their name implies, they bend upwards whenever disturbed. *Strumigenys capitata*, Sm., concludes the list of *Myrmicinae*.

D'Albertis has, however, stated some particulars concerning an ant which does not appear to be identical with any above recorded. He writes concerning it as follows:—"A curious species of ant lives in the trunks or at the roots of rotting trees. They are the deepest black in colour, and their bite is most annoying. They possess a property which I do not think has ever yet been described—that of jumping backwards, having collected themselves into a mass. When jumping they emit a sound like that produced by some species of *Elateridæ*." Of another, which he met with at Yule Island, he writes: "A very small black ant of extraordinary voracity, but which does not get into the house. In four hours the body of a dog as big as a hare was reduced to a perfectly polished skeleton." Again he informs us: "Houses are infested by a large black ant which is nocturnal in its habits, does not appear in the daytime, and only attacks vegetable substances."

Sub-Fam. **Cryptocerinae.**

This interesting group of ants has but one representative in New Guinea, viz., the remarkable *Cepaloxys capitata*, concerning which F. Smith, its author, has stated that it is one of the most remarkable insects with which he was acquainted, being the only species of ant which he had seen that had the eyes situated beneath the head (*cf. Journ. Linn. Soc. Zoology*, viii. 1864, p. 76).

Fam. **Mutilidæ.**

These solitary ant-like insects are represented in New Guinea by two species of the typical genus—*M. dorich*, Sm., and *M. agilis*, Sm., both obtained by A. R. Wallace.

Fam. **Thynnidæ.**

This family, again, has but two New Guinea representatives, *T. lævissimus* and *T. abductor*.

Tribe. **Fossores.**

Fam. **Scoliadæ.**

Scolia nigerrima, Sm., and *S. culta*, Sm., alone represent this family.

Fam. **Pompilidæ.**

This family includes those remarkable insects which fix earthen cells in every description of nook and cranny, filling the same with caterpillars or spiders, which they render torpid in order to serve as food for their larvæ by the time the latter have hatched from the eggs which they also deposit in these cells. M. Maindron has specially dealt with these insects (*cf. Ann. Soc. Ent. Fr.* (5) viii. 1878). In New Guinea the genus *Pompilus* is represented by four species (*P. bicolor*, Fabr., *P. fervidus*, Sm., *P. papuensis*, Sm., and *P. flavipennis*, Sm.),

of which the first-mentioned occurs in Australia also; *Agania pandora*, Sm., *Mygimonia ichneumoniformis*, Guér., *Macromeris violacea*, St. Farg.—the last an Indian insect—alone represent their respective genera. The rapid-flying insects belonging to the genus *Sphex* are represented by the silver-bodied Indian species *S. argentata*, Dahlb., and *S. diabolicus*, Sm.

Fam. **Crabronidæ**.

Typhoxylon providum, Sm., is the only described New Guinea species referable to this family—the wood-boring wasps.

Tribe. **Diploptera** (Wasps).

Fam. **Eumenidæ** (Solitary Wasps).

No less than thirteen species of New Guinea wasps have been assigned to this family, which comprises, as Wallace informs us, “the most abundant, beautiful, and characteristic Hymenoptera of the East.” “They are found (he adds) everywhere, in gardens, on roadsides, on the margins of streams, and in the forests.” The New Guinea species are: (1) *Eumenes circinalis*, Fabr.; (2) *E. esuriens*, Fabr.; (3) *E. urvillei*, Sauss.; (4) *E. arcuatus*, Fabr.; (5) *E. dorycus*, Maindr.; (6) *Rhynchium hæmorrhoidalis*; (7) *R. mirabile*, Sauss.; (8) *R. superbum*, Sauss.; (9) *R. medium*, Maindr.; (10) *R. Kuenckeli*, Maindr.; (11) *Odynerus petiolatus*, Sm.; (12) *O. bicolor*, Maindr.; (13) *Pterochilus eximius*, Sm.; and (14) *Ancistrocerus lucasius*, Maindr. Of these, Nos. 1, 2, 4, 7, and 8 occur also in Australia; Nos. 1, 2, and 4 in India as well, whilst No. 6 is met with not only in India but in Africa likewise. The species of *Eumenes* and *Rhynchium* build the familiar mud-nests fixed to various objects.

Fam. **Vespidæ** (Social Wasps).

Although no example of true *Vespa* has been recorded as being discovered in New Guinea, other well-known genera are well represented. The species found by Wallace were: (1) *Ischnogaster fulgipennis*, Guér.; (2) *Icaria Lefebvrei*, Le Guill.; (3) *I. maculiventris*, Sauss.; (4) *I. conservator*, Sm.; (5) *I. australis*, Sm.; (6) *I. reactionalis*, Sm.; (7) *Polistes diabolicus*, Sauss.; (8) *Polistes Picteti*, Sauss.; (9) *P. fastidiosus*, Sauss.; (10) *P. tepidus*, Fabr. It may be of some interest to draw attention to the fact that some of these wasps were the earliest collected of New Guinea Hymenoptera, having been obtained by the naturalists of the *Coquille*, which was at harbour in the north-east of the Bay of Geelvink from 26th July to 9th August 1824. The species of *Polistes* build stalked nests of a few hexagonal papery cells. These nests are suspended, with the mouths of the cells downwards, to the underside of leaves, twigs, branches, &c., and are without papery covering. Some of the nests are linear, others are disciform. The species of *Icaria* usually live in much larger communities than do those of *Polistes*, there being usually several tiers of comb, the whole enveloped in a papyraceous covering. These large nests are often high up amongst the branches of trees. On

the nests being accidentally disturbed the wasps attack with great vehemence. L. D'Albertis, referring evidently to the onslaught of a species of *Polistes*, relates the following characteristic incident:—"Jackson, too, had the ill-fortune to disturb a wasp's nest; the insects revenged themselves by stinging his neck and face severely. I saw him fall to the ground clasping his face and neck in his hands. He believed himself wounded by a flight of arrows." Wallace states that "the large nest of *Polistes picteti* has a nest consisting of a much larger number of cells, and in the Island of Goram I observed the natives eating the pupæ as a great luxury" (*Proc. Linn. Soc.*, xi. p. 297).

Tribe. **Anthophila** (Bees).

Fam. **Andrenidæ**.

This family is represented by two species of *Prosopis* (i.e., *P. imperialis*, Sm., and *P. elegans*, Sm.), and two species of *Nomia* (i.e., *N. dentata*, Sm., and *N. bidentata*, Sm.).

Fam. **Apidæ**.

The list of the New Guinea members of this family includes the following species, viz.: (1) *Megachile nitidulator*, Sm.; (2) *M. senex*, Sm.; (3) *Crocisa nitidula*, Fabr.; (4) *Saropoda bombiformis*, Sm.; (5) *Anthophora zonata*, Linn.; (6) *A. elegans*, Sm.; (7) *Xylocopa cærulea*, St. Farg.; (8) *X. dimidiata*, St. Farg.; (9) *X. æstuans*, Linn.; (10) *Trigonaflavifrons*, Sm.; and (11) *T. atricornis*, Sm. Of these, Nos. 3, 4, 5, 6, 8, and 9 occur also in Australia. *Megachile* is the bee which is familiar to residents in India, Australia, &c., from the fact that some of its members ingeniously construct nests of pieces of leaves, which, in the first instance, they cut and remove from the still growing plants. Wallace, however, relates that the different species have very variable habits—one boring holes in posts of houses, a second making holes in hard clayey ground, and a third building cells of a very sticky black wax. *Xylocopa* is a genus containing bees which call to mind the European Bumble-bee: they are remarkable from the fact of the sexes being often quite differently coloured, the females being bright yellow, buff, or fulvous, whilst the males are black or steel-blue. Their nests are made in dead branches and rotten wood, which are excavated for the purpose. These nests are approached through circular holes. *Trigona* is the small stingless honey-producing bee, which makes its nest in holes of trees, consisting of cells of, as a rule, dark wax. L. D'Albertis often met with this bee during his Fly River expeditions, and the following characteristic story evidently relates to it:—"While the men were cutting down an old tree, they discovered the hive of a small bee. The honey was almost black and the wax was reddish. Some of our party liked it, but it had, to tell the truth, a very bad smell. The bee is very small and has a particularly offensive odour." It seems also that he again has a species of *Trigona* in view when he writes: "If we anchor near the shore during the day, we are attacked by a bee which is quite as vicious as is the mosquito. It is small, black, and voracious. There is nothing on board, hard, dry, soft, or liquid, which it spares; meat, biscuits, fruit, nothing comes amiss

to this tormenting insect. It has no sting, and therefore causes no pain. But it is noxious in other ways, for it settles on the hands, on the face, in the eyes, in the ears, in the beard, and in the hair. If one attempts to remove it with one's fingers, it leaves a most unpleasant odour. It comes on board (in the Fly River) when the sun has hardly risen, leaving us at sunset. On land it lives in old trees, and produces a blackish honey and wax of a red colour, which is used by the natives in various ways."—*New Guinea*, vol. ii. pp. 80–81. The well-known naturalist Kendal Broadbent has also informed the writer that in some parts of New Guinea he found that small "native bees," which also got into his food, "smothered one," and seem to take the place of the flies of the inland districts of Queensland. Harold Hockings of Brisbane has described the habits and nests of two species of this interesting genus *Trigona*.

Fam. Chrysidæ.

Though no species of these interesting insects have been recorded as occurring in New Guinea, it is highly possible that several species will be met with there.

Fam. Evanidæ.

These Hymenoptera, which are destructive to the eggs of cockroaches, are represented by the *Evania lævigata*, Latr., which not only occurs in India, the Malay Archipelago, and Australia, but also in Mexico and Brazil. It may be often observed on windows, wagging its short triangular hind-body.

Fam. Aulacidæ.

The Indian *Megischus* (*Pimpla*) *coronata* alone represents this family of ichneumons.

Fam. Ichneumonidæ.

Numerous ichneumons occur in New Guinea, as in all other countries. The following species were collected there by A. R. Wallace:—*Ischnocerus dimidiatus*, Brullé; *Cryptus volatilis*, Sm.; *C. tarsatus*, Sm.; *Mesostenus leucozonius*, Brullé; *M. arogans*, Sm.; *Glypta fracticornis*, Sm.; *Pimpla eructator*, Brullé; *P. flaviceps*, Brullé; *P. trifasciata*, Sm.; *P. nigricornis*, Sm.; *P. interceptor*, Sm.; *Ophion flavalineatus*, Brullé; *O. stimulator*, Sm.

Fam. Braconidæ.

These ichneumons are represented in New Guinea by *Bracon marginellus*, Brullé; *B. gravidus*, Sm.; *Agathis guineensis*, Brullé; *A. interdicta*, Sm.; *A. fenestrata*, Sm.

Fam. Tenthredinidæ.

No species of New Guinea saw-flies seem to have been recorded since 1882, in which year N. F. Kirby's "Tenthredinidæ and Siricidæ" was published. This work mentions the following insects as being New Guinea species:—*Ancyloneura nigripes*, Sm.; *Cladomacra macropus*, Sm.; and *Senoclia purpurata*, Sm.

V.

ORDER : LEPIDOPTERA.

Sub-Order : **Rhopalocera** (Butterflies).

In any notice of the butterflies of British New Guinea, it seems desirable that a reference should be made to those who have been instrumental in making us acquainted with them. The naturalists accompanying the *Rattlesnake*, which visited the island in 1846-50, collected a few specimens, and these were described by Professor Westwood in the Appendix to the journal descriptive of the voyage of that vessel. Montrouzier afterwards landing at Woodlark Island, in a missionary capacity, procured an interesting series of insects, which in 1856 were made the object of a detailed notice by him in the *Annales des Sciences Physiques et Naturelles de Lyon*. Owing to the geographical position of this island, one would expect important light to be thrown by such an investigator as Montrouzier upon the nomenclature of the butterflies of the eastern end of New Guinea, and of the islands lying beyond. Messrs. Salvin and Godman have directed attention to this fact, and no doubt, whenever all the species dealt with by Montrouzier have become definitely recognised, it will be found necessary, in many cases, to regard as synonymous with his terms some of the designations assigned to New Guinea butterflies by subsequent writers. Dr. Comrie, the surgeon of the *Basilisk*, again obtained butterflies during the surveying cruise of that vessel in 1871-76 in Eastern New Guinea and on some of the adjacent islands, notably at the D'Entrecasteaux Group. The species procured by him are enumerated and described, where occasion arises, in the *Proceedings of the Zoological Society of London* for 1878 by Messrs. F. D. Godman and Osbert Salvin. In 1875 Mr. W. Macleay, accompanied by a scientific staff, visited in the *Chevert* Hall Sound and other parts of New Guinea. Though many butterflies were obtained on this occasion, no published list of them has been met with. Amongst those who accompanied the vessel was Dr. James (who afterwards met with his death at the hands of the natives of Yule Island), and he procured a small collection of butterflies, which are dealt with by Mr. A. G. Butler in the *Proceedings of the Zoological Society* for 1876. The same writer has also written concerning two collections which were obtained, one by Dr. W. Y. Turner at Port Moresby, and the other in South-East New Guinea, in vol. xviii. Series iv. 1876, and Series v. vol. i. 1878, of the *Annals and Magazine of Natural History*, and in the *Proceedings of the Zoological Society* for 1877.

We now come to write of L. M. D'Albertis and his collections made at Yule Island and in the valley of the Fly during his three expeditions, 1875-77. Unfortunately many of the insects obtained in the former locality were lost during a shipwreck, but still the great energy of this naturalist is manifested in the fine series of *Rhopalocera* now resting in the Genoa Museum. These have been dealt with by C. Oberthür in his *Etudes sur les Collections de Lépidoptères Océaniens appartenant au Musée Civique de Gênes*. In 1879 Andrew Goldie for-

warded to England a series of butterflies obtained by him some thirty miles inland from Port Moresby, and the more interesting of the novelties comprised in this collection were described in the *Proceedings of the Zoological Society of London* for 1880 by F. D. Godman and O. Salvin. In 1886 the Royal Geographical Society of Australasia equipped an expedition to the Fly River under the leadership of Captain H. C. Everill. On this occasion a small but interesting set of butterflies was obtained by Mr. Froggatt, one of the members of the expedition. A part of this collection has passed through the writer's hand, and has been considered in connection with New Guinea butterflies derived from other sources in the second Annual Report of Sir W. MacGregor, Administrator of British New Guinea. When Sir W. MacGregor led his well-known expedition to the summit of the Owen Stanley Range, he returned with a collection of butterflies, which was afterwards examined and reported on by W. H. Miskin in the Administrator's first Annual Report.

Mr. Sayer, during the expedition to Mount Obree led by Mr. Cuthbertson, also procured a number of butterflies. These are enumerated by Mr. H. Goss in the *Proceedings of the Entomological Society of London* for 1888. Finally, in the Appendix to the second Annual Report of the Administrator (Sir W. MacGregor) we have a list, furnished by the writer, of butterflies collected under the auspices of the Administrator in the valley of the Fly by C. Kowald, and at Hall Sound, and at different points along the coast as far as Bentley Bay, by Charles Hedley.

In addition to these are several memoirs relating to collections of insects derived either from parts of New Guinea lying beyond the territorial limits of the Protectorate, or from localities even outside the great island itself, but closely adjacent thereto, that have a direct bearing on the study of the subject under consideration. Again, there are monographs dealing with special families, or even smaller groups, of Lepidoptera, which include in their scope the species of such groups which are known to occur in British New Guinea. In the latter category must be included A. R. Wallace's papers: (1.) "On the Phenomena of Variation and Geographical Distribution, as illustrated by the Papilionidæ of the Malayan Region" (*Trans. Linn. Soc.*, 1865); (2.) "On the Pieridæ of the Indian and Australian Regions" (*Proc. Ent. Soc. Lond.*, vol. iv. 1865-68); Snellen Van Vollenhoven's paper on the Pieridæ in the *Tidschrift voor Entomologie* (1860); C. Oberthür's *Catalogue Raisonné des Papilionidæ* (Rennes, 1880); Butler's paper, amongst others, on the genus *Euplœa* (*Journ. Linn. Soc., Zool.*, vol. xiv. 1878), &c.; the monographs of F. Moore on the Asiatic Lepidoptera referred to the genus *Mycalesis* (*Proc. Ent. Soc. Lond.*, 1880), and on *Lomnaina* and *Euplœina* in the *Proceedings of the Zoological Society* of 1883. Among the memoirs dealing with collections of butterflies derived from other parts of New Guinea may be mentioned, in the first instance, that of Guérin (*Voyage de la Coquille—Insectes*), who describes the insects obtained on the north-west coast by M. D'Urville, and that of Boisduval (*Faune Entomologique de l'Océan Pacifique in Voyage de l'Astrolabe*, Paris, 1832-35). The latter publication must be regarded as of additional importance, seeing that it embraces a consideration of the collections of Admiral Dumont d'Urville, already dealt with by Guérin, and refers to the insects collected

by Sir Joseph Banks in Cook's voyages, and afterwards described by Fabricius, and also those obtained by La Billardière, D'Entrecasteaux, Peron, Freycinet, and others. At the same time reference is contained in Boisduval's memoir to the descriptions and figures of Lewin, Donovan, Leach, Macleay, &c. Relating to the same region of New Guinea, visited both by the *Coquille* and the *Astrolabe*, we have Kirsch's paper in the *Mittheilungen K. Zool. Mus.* of Dresden, vols. i. and ii.; Felder's, in vols. iii. and iv. of the *Entomologische Monatschrift* of Vienna, and C. Oberthür's *Etudes sur les Lépidoptères Recueillis en 1875 à Dorei par Prof. O. Beccari* (*Ann. Mus. Genov.*, vol. xii. 1878, pp. 450-470). The student of New Guinea butterflies cannot, too, afford to lose sight of Mr. W. H. Miskin's "Synonymic Catalogue of Australian Rhopalocera" (Brisbane, 1891), or the less ambitious papers dealing with Cape York butterflies by Mr. Butler, and contained in the *Annals and Magazine of Natural History* for 1876 (Ser. iv. vol. xviii.), and in the *Proceedings of the Zoological Society* for 1877. He, too, will perforce have to consult Mr. Butler's papers on the "Butterflies of the South Sea Islands" (*P. Z. S.*, 1874); on those of the New Hebrides (*P. Z. S.*, 1875), and on those of New Ireland, collected by Rev. G. Brown (*P. Z. S.*, 1879); Messrs. Godman and Salvin's dissertations on New Ireland, and New Britain, butterflies, obtained by the Rev. G. Brown (*P. Z. S.*, 1878), on Solomon Island ones (*Ann. and Mag. of Nat. Hist.*, Ser. vi. vol. i.), and on Duke of York Island Lepidoptera, also procured by the Rev. G. Brown, in the *Proceedings of the Zoological Society* for 1877. Boisduval's *Faune de l'Océanie* also contains descriptions of New Guinea butterflies, and insects from the same source are figured by Hewitson ("Exotic Butterflies," &c.), and others. Again, the minor contributions to entomological literature of Dr. A. R. Wallace and several more of the authorities already cited need to be consulted. One of the most interesting contributions to our knowledge of New Guinea insects, however, exists in Gervase F. Mathew's "Life-Histories of Rhopalocera from the Australian Region," contained in the Entomological Society's *Proceedings* for 1887. The material for this memoir, as far as it relates to New Guinea, was obtained at Port Moresby in the months of November and December 1884.

Fam. I. Nymphalidæ.

Sub-Fam. I. Danainæ.

British New Guinea is exceedingly rich in butterflies belonging to the sub-family Euplocinæ; the divisions Lomnaina (Danaidæ) and Euplocina, as defined by F. Moore, being both well represented. The species of Danais, as is now well known, possess, in addition to the odoriferous anal tufts, present also in the males of the different species of Hamadryas and Euploea, remarkable scent-producing organs distinctive of the male sex; these, in the form of small pouches, are placed upon the hind-wings. This feature has been employed as the basis of a classification of the species of Danais by F. Moore. Adopting his subdivisions, we find two species, *Danais (Radena) sobrina*, Boisd., and *D. (Radena) Turneri*, Butler, in the group characterised by the absence of this sexual mark or scent-producing organ on the hind-wings. To the latter F. Moore assigns the habitat

Thursday Island (*cf.* *P. Z. S.*, 1883), but Mr. Butler, when describing the species, stated that it was procured at Port Moresby. *D. sobrina*, Boisd., as has been previously remarked, is closely mimicked by a butterfly of a different family, *i.e.* *Papilio thule*, Wall. (*infra*, p. 267). The whole subject of mimetic analogies and mimicry generally amongst lepidopterous insects having been brought to the notice of the scientific public by Bates in his masterly "Contributions to the Insect Fauna of the Amazon Valley" (*Trans. Linn. Soc.*, vol. xxiii. 1862, pt. 2), and afterwards discussed with additional illustrations by such eminent naturalists as Wallace (who first, in 1866, drew attention to the instance now quoted), Trimen, Riley, Darwin, and others, it is scarcely practicable for the writer to throw further light upon this wonderful phenomenon, nor do the exigencies of space admit of the inclusion here of a condensed account of the subject. It may, however, be remarked *en passant*, that one would perhaps least expect a butterfly to imitate one of the few non-protected Danaidæ, *i.e.* one without scent-pouch, this organ being now regarded as subserving the purpose of defence, owing to its odoriferous function. The species of Danais endowed with one sexual mark or scent-producing organ on the hind-wings are *Danais* (*Tirumala*) *leucoptera*, Butler; *D.* (*Tirumata*) *hamata*, M'Leay; *D.* (*Anosia*) *erippus*, Cram.; *D.* (*Limnas*) *chrysippus*, Linn., var. *mytiline*, Feld.; and *D.* (*Salatura*) *affinis*, Fabr. Of these, the first two, having the wings pale-blue with bars and spots of black, are probably only forms of *D. melissa*, Cram., and the third is the world-roaming "milk-weed butterfly," the larva of which feeds upon the *Asclepias curasavica*, which lends itself so readily for introduction from one country to another. It is scarcely possible to discover the date of its arrival in New Guinea. Now it occurs from Yule Island to Dinner Island, and on the intervening mainland. It was one of the butterflies obtained at Tutuila and at Uplu by Mr. Brenchley during the voyage of the *Curaçoa*, 1873-74, and it may have arrived thus early in New Guinea also. In *Danais* (*Limnas*) *chrysippus*, Linn., we are introduced to another remarkable case of mimicry. Amongst the Nymphalidæ there is an insect named *Hypolimnas misippus*, Linn., the male of which closely resembles the same sex in the well-known *Hypolimnas bolina*, both having the same blue-bordered white spots. The female *Hypolimnas misippus* is, however, quite different in both its forms—for it is dimorphic—from the female of its congener; but it presents us with a close copy of the above-mentioned Danais. In it we have the form of wing nearly reproduced, the same fulvous-red ground colour, the same subapical oblique series of white spots on a dark background, and even the scent-pouch seems to be indicated in a costal round black spot in the hind-wing of the Nymphalid. *Limnas chrysippus* ranges in British New Guinea from Yule Island to the D'Entrecasteaux Group. *Hypolimnas misippus* occurs at Cape York and other parts of Australia, but has not yet been recorded as occurring in British New Guinea. Both have beyond these regions an extensive geographical range. The butterflies in this group (with the exception of *D.* (*Salatura*) *ferruginea* and *D.* (*Tirumala*) *leucoptera*, if a distinct species) occur in Australia also. Mr. F. Moore has called attention to the mimicry which is present between the former of these insects and *Euplœa Jamesi*, Butler, and *Euplœa Doleschallii*, Feld. It is not obvious which of these insects is the

imitator and *vice versâ*. *Danais* (*Asthipa*) *gloriola*, Butler (*D. citrina*, Feld.), is the only *Danais* in British New Guinea which has two scent-producing organs or pouches on each hind-wing, and thus forms the sole representative of a third division of the genus. The type was procured at the Aru Islands. D'Albertis found it at Yule Island, and two specimens which are before the writer were collected on the Fly River and at Manu Manu respectively.

The Euplœinæ are also very numerous and variable, it having been remarked that every island has its distinct species; notwithstanding some have a somewhat wide range of occurrence, being met with in Gilolo, Aru, Waigiou, Bowru, and other islands of the Malay Archipelago. A *Euplœa* from Milne Bay appears to be identical with *E. distanti*, Moore, from Sumatra, and the type of the not uncommon *E. treitschkei*, Boisd., is said to have been procured in New Ireland. In studying this group, it is difficult to over-estimate the assistance rendered by Butler's numerous papers on these butterflies, and notably his "Butterflies hitherto Referred to the Genus Euplœa" (*Journ. Linn. Soc. Zool.*, vol. xiv. pp. 290-303), also the work of F. Moore, especially his paper on *Limnaina* and *Euplœina*, to which reference has already been made. The insects belonging to the latter group, *i.e.* Euplœina, have many of them odoriferous sericeous sexual brands on the fore-wings, and, less frequently, glandular patches on the hind ones. The presence or absence of these sexual marks and their numerical development, together with other characters, have been utilised by Butler since 1878 for the purpose of distributing the very numerous species comprised in the group into easily recognised sub-genera. Butler has been followed by Distant, De Niceville, Moore, and others. In accordance, then, with the views of the last-mentioned authority, the forty species occurring in British New Guinea may be grouped in the following manner:—(1.) Species of Euplœa the males of which are without any sexual mark or scent-producing organ on the fore-wing, *viz.*, *Hamadryas zoilus*, Fabr.; *Hamadryas æquicinctus*, Godm. et Salv.; *E. (Oranasma) lugens*, Butler; *E. (Patosa) funerea*, Butler; *E. (Patosa) squalida*, Butler; *E. (Patosa) Batesii*, Feld. (*E. lapeyrousei*, Butler [nec. Feld.]); *E. (Patosa) resarta*, Butler; *E. (Gamatoba) diadema*, Moore; and *E. (Gammatoeba) nox*, Butler. It may be remarked concerning the first mentioned of these butterflies that it also occurs in Australia. Moore assigns the habitat Port Moresby to the four species of *Patosa*, to *Oranasma lugens* and to *Gamatoba diadema*. *Hamadryas* is usually regarded as the nearest representative in Australia and New Guinea to that great group of South American Butterflies, the Heliconidæ; and, in fact, Doubleday and Hewitson in their great work, "The Genera of Diurnal Lepidoptera," regarded *Hamadryas* as a genus belonging to the Heliconidæ. Moore, however, has remarked that, seeing that *Neptis* (*Phædyma*) *Shepherdi* and other species of the same genus approach considerably in form and pattern of markings to the South American Heliconid *Titherea bonplandi*, it appears probable that we may find in this region a connecting form between Euplœina and Heliconina nearer than *Hamadryas*. *Neptis Shepherdi* has not yet been reported as occurring in British New Guinea, although it probably extends northwards in Australia as far as Cape York, having been met with at Cairns.

The species of *Euplœa* falling within the group characterised by the posses-

sion in the male insects of (2) one sexual mark or sericeous scent-producing organ on the fore-wing are *E. (Chanapa) angasi*, Feld.; *E. (Bettanga) vitella*, Montr.; *E. (Crastia) Distanti*, Moore; *E. (Rasuma) violetta*, Butler; *E. ordinata*, Moore; *E. denticulata*, Moore; *E. bipunctata*, Moore; *E. dolosa*, Butler; *E. pleiadis*, Moore; *E. louisa*, Moore; *E. siderea*, Moore; *E. astræa*, Moore; *E. stella*, Moore; *E. (Chirosa) pierretii*, Feld.; *E. Lapeyrousei*, Boisd.; and *E. (Mestapra) eurianasia*, Hew. The first-mentioned of these is the common *Euplœa* of Southern Queensland. The New Guinea habitat is assigned to it on the authority of Goss, to whom were referred a small collection of insects obtained by Sayer inland from Port Moresby towards Mount Obree. *Euplœa vitella*, Cram., is one of the insects reported by Montrouzier to have been found by him on Woodlark Island. The ten species of *Rasuma* mentioned are stated by Moore to exist in one locality, viz., Port Moresby. Only one of these ten, i.e., *E. (Rasuma) dolosa*, Butler, has been obtained by any one else in British New Guinea, and this was secured in Southern New Guinea (? Hall Sound) by D'Albertis. These and other considerations would make it appear that we have here many forms of one or two polymorphic types, one of which is *Euplœa dolosa*, Butler.

Species of *Euplœa* having two sexual marks or scent-producing organs on the fore-wings are *E. (Stictoplœa) mæsta*, Butler, *E. (Stictoplœa) Doleschallii*, Feld., and *E. (Stictoplœa) immaculata*, Butler. These three species are reported by Moore as occurring at Port Moresby, and were probably collected by Dr. Turner.

We now come to consider the *Euplœina* which, in the male sex, are endowed with a glandular patch of peculiar scales on the hind-wing, a feature not present in the species already mentioned. Amongst the species in which (4) this patch is present, but which have no sexual mark on the fore-wings, there occur in British New Guinea *Euplœa (Calliplœa) infantilis*, Butler, *E. (Calliplœa) Jamesi*, Butler, *E. (Calliplœa) Saundersi*, Butler, and *E. (Calliplœa) parvior*, nob. The two former of these butterflies were collected at Yule Island by Dr. James, and described by Butler in the *Proceedings of the Zoological Society* for 1876. The third is regarded by some authorities as being identical with *E. Tulliolus*, Fabr., a butterfly which, inasmuch as it is met with both in North-East Australia and in the New Hebrides, might be expected also to occur in New Guinea. *Euplœa parvior* is a diminutive species collected during an expedition of Sir William MacGregor to Kiwai Island.

The species of *Euplœa* in which the glandular patch is present in the males on the hind-wings, and which have also a single sexual mark upon the front ones, comprise some of the most handsome kinds of New Guinea *Euplœina*. These are *Euplœa (Saphara) treitschkei*, Boisd., *E. (Hirdapa) usipetes*, Hew., *E. (Hirdapa) suada* (Misk.), *E. (Hirdapa) spartacus* (Misk.), *E. (Salpinx) hisme*, Boisd., *E. (Salpinx) callithoe*, Boisd., and *E. (Salpinx) iphianassa*, Butler. *Euplœa treitschkei* is a large butterfly, with the ground-colour black, but appearing dark-violet or olive-green in certain lights, with a single curved row of submarginal white spots on the hind-wing. It was originally found in New Ireland, and since then has been met with at Duke of York Island. Comrie obtained it during the voyage of the *Basilisk* at the D'Entrecasteaux Islands, and the writer has seen

specimens from Bentley Bay, and from Samarai (Dinner Island). Sir William MacGregor also brought it to Brisbane on his return from the Owen Stanley Range expedition, in company with *Euplœa usipetes*, Hew., and the two species of *Calliplœa* described by W. H. Miskin.¹ *Euplœa* (*Salpinx*) *callithoe*, Boisd., another insect belonging to this group, is one of the most beautiful butterflies to be met with in New Guinea. It has a wing expansion of more than four inches. The male has the wings dark-brown, with a violet gloss when viewed in certain lights. In the cell of the fore-wing there is a pale-violet spot, and a band of the same colour, interrupted by the black veins, across the apex; a series of cæruleous spots also follows the outer margin of both. The female, amongst other differences, has on the anterior wings a large externally ill-defined white patch, which occupies the centre of the disc and extends inwards half across the cell, and forwards and outwards so as to involve and merge with the sub-marginal row of pale-blue spots. This superb butterfly was obtained by Sir William MacGregor at Kiwai Island (Fly River), and at the D'Entrecasteaux Islands by Comrie.

The species of *Euplœa* have a characteristic heavy flight, moving in low undulations, and sometimes floating lazily overhead. The ground-colour of their wings varies from almost black to light-brown, and is often paler externally, as in *E. Lapeyrousei*, Boisd. They may be simple or appear olivaceous purple or violet in certain lights. The wings, also, may be spotless, as in *E. immaculata* and *E. pierretii*, or have well-developed marginal white bands or marginal series of spots of the same colour, as in *E. eurianasia* and *E. distantii*. These butterflies are protected at all periods of their existence from birds and other enemies. In their caterpillar phase they are known to be distasteful. The chrysalis in many species reflects a bright speculum-like sheen in bright light, and the imago has scent-producing brands or granular patches upon its wings or odoriferous anal tufts. No wonder then that they are the object of imitation by other butterflies. More remarkable still, however, is the mimicry which subsists between different species of the same genus *Euplœa*, but belonging to different sub-genera of it. As an instance, there is the mimicry which obtains, as F. Moore has pointed out, between three species occurring at Port Moresby, viz., *Euplœa* (*Patosa*) *Batesii*, Feld., *E.* (*Chirosa*) *pierretii*, Feld., and *E.* (*Stictoplœa*) *immaculata*, Butler. In the first mentioned there is no sexual mark or scent-producing organ on the fore-wing, in the second there is one, and in the third there are two. As a further example, *Euplœa* (*Rasuma*) *violetta*, Butler, *E.* (*Calliplœa*) *Jamesii*, Butler, and *E.* (*Stictoplœa*) *Doleschallii* mimic one another,—the first mentioned having two sexual marks on the fore-wing, the second none, but a glandular patch on the hind-wing, and the third two. Again, mimicry exists between each of these three and *Danaïs* (*Salatura*) *ferruginea*, Butler.

¹ It seems to the writer that Mr. Miskin may have unavoidably fallen into an error as regards the habitat of these species, the writer having already examined examples of all four obtained at Samarai (Dinner Island) by Mr. Edelfeldt, these being, it is said, duplicates of insects given by the latter to Sir William MacGregor between the date of his return from the Owen Stanley Mountains and his arrival in Brisbane with the collections obtained there.

Sub-Fam. **Satyrinæ.**

This sub-family is fairly well represented in British New Guinea. It is probable, however, that many more species referable to it have yet to be brought to light. The following is a list of those already recorded as occurring there :—*Melanitis* (*Cyllo*) *amabilis*, Boisd. ; *M. leda* (1) var. *taitensis*, Feld. ; (2) var. *solandra*, Fabr. ; *Mycalesis* (*Orsotriena*) *medus*, Fabr. ; *M. hesione*, Cram. ; *M. (Orsotriena) medus*, var. *doris*, Cram. ; *Ypthima subarctous*, mihi ; *M. (Calysisme) pernotata*, mihi ; *M. (Calysisme) perseus*, Fabr. ; *M. (Mydosama) terminus*, Fabr. ; *M. (Mydosama) flagrans*, Butler ; *M. (Mydosama) cacodemon*, Kirsch ; *M. (Mydosama) asophis*, Hew. ; *M. (Mydosama) shiva*, Boisd. ; *M. (Mydosama) phidon*, Hew. ; *M. (Sevandra) dorycus*, Boisd. ; *M. (Sevandra) mucia*, Hew. ; *M. (Sevandra) melopis*, Godm. et Salv. ; *M. (Lamprolenis) nitida*, Godm. et Salv. ; *Hypocysta osiris*, Boisd. ; *H. hæmonica*, Hew. These butterflies occur in scrubs or shady forest country, either dry or humid. The butterfly which Boisduval dedicates to the literary lady Amable Tastu, with the designation *Cyllo amabilis*, has been met with inland from Port Moresby and at Port Moresby. Above, this rather large Satyrid is reddish-brown, and the fore-wings are obliquely crossed by a broad yellowish-white band. Beneath, the hind-wings have a submarginal row of five blue, black, and yellow eye-spots. The type of this species is said by Boisduval to have been sent from New Ireland. *Melanitis leda*, Linn., appears to be an uncommon insect in British New Guinea, it not, as it seems to the writer, having fallen to the lot of D'Albertis to capture it. The specimens hitherto obtained at Port Moresby and Milne Bay have been referred to the forms *M. Solandra*, Fabr., and *taitensis*, Feld., of this most variable insect. Though a well-known butterfly, the reader may profitably peruse the following succinct statement of its habits from the pen of Mr. G. F. Mathew, who has also described its transformations :—"It is principally to be found in shady spots in the forest, particularly by the sides of pathways, where there is plenty of coarse grass, or by the edges of clearings where sugar has been planted. It has an uncertain, jerky, manner of flight, rising suddenly from under one's feet, flying for a short distance, and pitching abruptly, usually selecting a spot covered with dead leaves, where, with its wings closed over its back, it defies detection, as the colourings and markings of the under-side harmonise so completely with its surroundings that it is very difficult to see, and it will not take flight until one nearly treads upon it. It does not care to fly much during the day, except when the weather is dull, or when it is raining. Towards sunset they begin to get more lively, and may be seen flitting across the pathways or sporting in forest glades ; and long after sunset I have seen them flying wildly at a considerable elevation" (*P. E. S.*, 1880). Except in the case of the two species of *Melanitis* above referred to, all the Satyridæ of British New Guinea have, on the bases of the veins of their fore-wings, peculiar swellings, and in addition to this character they have, either on their hind-wings only or on both, glandular pouches (or scent-producing organs) covered by a tuft of hairs. These latter, however, are not present in *Hypocysta*. The first of these features has been used by Dr. Semper to classify the different

genera of the family (cf. *Reisen im Archipel der Philippinen von Dr. C. Semper—Die Tagfalter—Rhopalocera*, p. 34, 1886), and the latter character has been employed by Moore in subdividing the large genus *Mycalesis* (cf. *Trans. Ent. Soc.*, 1880, pp. 155–177). In this latter the colours are usually dull, with the inner and outer halves of the wings beneath well defined, and separated by a transverse band, or distinguished by a difference in their respective ground colours. Ocelli, more pronounced beneath, form a more or less continuous series along the outer margins. They may have a wing-expansion of two inches or more, but this is generally less. Two of the larger and more handsome species *M. (Sevandra) dorycus*, Boisd., and *M. (Sevandra) mucia*, Hew., the former of which occurs at Milne Bay and D'Entrecasteaux Islands, and the latter some miles inland from Port Moresby, are dark-brown above with definite portions of the wings orange. Beneath they are lighter, with the outer and inner halves separated by a reddish-brown band, external to which occur large black eye-spots with pale-violet pupils and yellow iris. They have a single glandular patch at the base of the first subcostal branch of the hind-wings, as is the case in the majority of species of *Mycalesis* occurring in British New Guinea. Amongst other noteworthy species is *M. (Calysisme) perseus*, Fabr., an insect which is also met with in Queensland. The delicate little brown or yellowish-brown Satyrids, which have a circle surrounding the ocelli of the hind-wings and the marginal band silvery, are represented in British New Guinea by two species, *Hypocysta hæmonia*, Hew., and *H. osiris*, Boisd., both of which were obtained by D'Albertis at Hall Sound, and the latter in the neighbourhood of Mount Obree, by Sayer, also. *Yphthima subarctous*, mihi, a small dark greyish-brown insect, expanding to rather less than $1\frac{1}{4}$ inch, having a single ocellus on the fore-wing only, occurs at Milne Bay. It is allied to the Australian *Y. arctous*, Fabr.

Sub-Fam. **Morphinæ.**

A large number of butterflies from New Guinea, described by different authors under the names *Morpho*, *Hyades*, *Drucilla*, and *Tenaris*, form a well-marked section in this family. They may all be regarded as species of one genus, *i.e.*, *Tenaris*, and are usually large butterflies with broad round clear-white wings, having a smoky-brown colouration more or less suffused over the entire surface, or concentrated and intensified along the costal border of the fore-wing. Their most conspicuous feature, however, is due to the presence of very large eye-spots with pale-violet pupils and yellow iris. Their flight is both weak and slow, and as a rule they just hover over the ground, now and then settling upon it. The majority of the species of this genus occurring in British New Guinea are probably varieties of *T. catops*, Boisd., allied to the form *T. mylæcha*, Westw., the type of which was obtained during the voyage of the *Rattlesnake* in the Louisiades. Such is *T. Jamesi*, Butler, from Yule Island. The typical insects belonging to the genus *Tenaris* are remarkable for the almost perfect uniformity of their white colouration. A species obtained by Mr. Froggatt on the Fly River seems identical with *T. bioculata*, Guér. This insect, the female of which has a wing-expansion of $3\frac{1}{2}$ inches, has the fore-wing white with a rufous tinge, and

having its costal margin, part of its outer margin, and its apex dark-brown. The hind-wing is orange-yellow, becoming blackish outwardly, and has a dark spot on the costal margin, and another near the inner one, the former enclosing a single ocellus with blue pupil and iris, and the latter two such ocelli. It is especially interesting as being mimicked by the female of the Satyrid butterfly *Melanitis agandas*. *T. Butleri*, Oberthür, from Yule Island, is quite brown on the upper surface. Other species are *T. myops*, Feld., from the mainland and also from the D'Entrecasteaux Group, with its ally *T. artemis*, Vollenhoven, from Yule Island; *T. dimona*, Hew., from the Fly River; *T. molaus*, Kirsch, from Hall Sound and the neighbourhood of Mount Obree, and *T. urania*, Linn., from the Fly River. There is also a Papuan species named *T. selene*.

Sub-Fam. **Nymphalidæ.**

Represented in British New Guinea by the solitary species *Acraea andromacha*, which is common everywhere. Following the classification of Dr. Schatz, as developed in his *Die Familien und Gattungen der Tagfalter* (pp. 24-26), a commencement may be made with the Pseudo-Nymphalis group. This is represented in British New Guinea by *Prothoë leucis*, (Boisd.) [*Mynes leucis*, Boisd.], an example of which, obtained by C. Hedley at Milne Bay, is before the writer. This is a rather small butterfly with dark-brown sub-caudate wings, having glaucous-green scales at the base of each. The fore-wings above are crossed by a broad sulphur-yellow patch, and the centres of the hind-wings are similarly coloured. Beneath there are numerous white spots and white patches, the latter corresponding in position to the sulphur-yellow patches above. On the under-surface also there are two submarginal linear series of greenish-white curved spots. Wallace states that this and the allied species frequent shady places in the forest; that the females often settle on the ground, while the males rest on low foliage. The allied insects *Mynes Guerini*, Wallace, and *M. Geoffroyi*, Guér., may be expected to occur within the limits of the Protectorate, but do not appear to have yet been met with there. No butterflies referable to the *Charaxes* group have yet been forwarded from British New Guinea. Seeing, however, that so many species of *Charaxes* were obtained by Wallace on the north-west coast of the Great Island, it is highly probable that some will be obtained there also, and especially one or more of the numerous varieties of *Charaxes pyrrhus*—as, for instance, the Australian *C. sempronius*. These insects usually fly somewhat high, and are fond of suddenly alighting on the dead branches of trees. They occur, however, in more accessible positions when resorting to the food-plants of their caterpillars, which are usually species of *Albizzia*, *Pithecolobium*, and allied Leguminosæ.

The *Adolias* group finds its representative in *Symphædra æropus*, Linn. (*Lexias æropus*). This handsome insect was obtained by C. Kowald during Sir William MacGregor's Fly River expedition at Kiwai Island. On the upper surface the wings are dark-brown, and there is a broad luteous or white band continued across both pairs, with short narrow bars of the same colour extending backwards from the costa of the fore-wings at their bases. On the under-surface the wings

are light rusty-yellow with a few pale violet spots, one of which, behind the border of the fore-wing, at the base, forms an eye-spot.

The *Parthenos* group is represented by *Parthenos sylvia*, Cram., var. *tigrina*, Vol., a handsome butterfly, with a wing-expansion of three inches, which has been obtained in the valleys of the Fly and St. Joseph Rivers and at Doura. The typical species, or its varieties, have, however, a wide range of occurrence, being met with in the Moluccas and Philippines. The New Guinea insect has the wings above dark-brown, inclining to rusty-red towards their bases, in which position there are on each outwardly-directed dark bands. A series of very distinct white spots cross the anterior wings beyond their middles. Beneath they are light-brown with a greenish suffusion, and are marked by black bands, spots, and lines, and white spots—the latter corresponding in position to those on the upper surface.

The *Cynthia* group seems to attain a large development in the Protectorate, the genera *Cethosia*, *Terinos*, *Cynthia*, *Cirrochroa*, *Cupha* (Messaras), and *Nissoria*, (Atella), having each representatives there. The beautiful *Cethosia cydippe*, Linn., whose scalloped wings are scarlet-coloured above, and broadly bounded externally by a blue-black band, is represented by what appears to correspond to the variety *chrysippe*, Don., which is met with from the Fly River to the D'Entrecasteaux Islands and in North-East Australia.

Two species of *Terinos* have been reported as existing in British New Guinea, viz., *T. alurgis*, Godm. et Salv., and *T. novæ-guinensis*, mihi. The former was obtained by Goldie in 1879 some thirty miles inland from Port Moresby, and the latter in 1886 during the Fly River expedition of the Royal Geographical Society of Australasia. These, it is thought, may prove identical, but at present the means are not forthcoming for deciding the question. *Terinos novæ-guinensis*, whose falcate fore-wings have a spread of from $2\frac{3}{4}$ to $3\frac{1}{3}$ inches, has the upper surface rich violet-blue, with an olivaceous patch of plush-like scales on the outer side of each wing; beneath, the wings, which exhibit bluish-grey reflections, are reddish-white, and have rufous and rufous-brown markings. Wallace, in referring to these interesting insects (*Proc. Ent. Soc.*, 1869), has directed attention to the remarkable fact, that though a difference in the venation of the wings is usually regarded as affording a structural character sufficient for the separation of genera, we have in the different species of this well-marked genus *Terinos* an instance of the truth of Darwin's law, that when a particular character varies sexually, it also varies specifically, and a case in which there is a constant difference in the position of the point of origin of the disco-cellular on the median vein, not only in the different species, but in the opposite sexes of the same one. There are about a dozen species of *Terinos* known to science.

The genus *Cynthia* is represented by the variety *Ada*, of Cramer's *C. arsinoë*. This large and handsome insect, which occurs at Woodlark Island, and along the southern coast of New Guinea to Port Moresby, and probably farther west, and is also met with in Australia, at Cape York, and a few hundred miles to the south, is remarkable for the conspicuous difference which exists between the two sexes; the male being rust-coloured, with blackish lines and spots, and having two small eye-spots on the hind-wings, and the female decidedly brown

in colour, with a broad externally ill-defined white band crossing the front wing at its middle and continued into the hinder one. *Cirrochroa ducalis*, Wallace, occurs at Samarai (Dinner Island), the writer having examined specimens obtained there by Edelfeldt, but it is doubtful whether it exists in the country intervening between Port Moresby and the Owen Stanley Mountains, as is recorded. The genus *Cupha*, Billberg (*Messararas*, Doubl.), is represented by *Cupha Turneri*, Butler, *C. madestes*, Hew., and *C. alciope*, Cram. The first mentioned of these insects, which is scarcely, if at all, distinct from the species of *Cupha* inhabiting North-East Australia, occurs from the Fly River to Milne Bay; the second is probably identical with it, and was obtained, together with *C. alciope*, Cram. (a species unknown to the writer), at Yule Island by D'Albertis, as we are informed by Oberthür. Butler has referred to a new species of the genus *Atella* with the designation *Atella cervina*, a butterfly obtained by Dr. James at Yule Island. It is probable also that *N. (Atella) egista*, Cram., which is reported to occur in other parts of New Guinea, and which seems closely allied to, if not identical with, W. H. Miskin's *Atella propinqua* from North-East Queensland, will, too, be met with within the limits of the Protectorate.

The *Cyrestis* group has two representatives, viz., *Cyrestis acilia*, Godt., and *C. achates*, Butler. The former, which is a common insect in North-West New Guinea, occurs at Bentley Bay, and between there and Port Moresby. The latter has been obtained by Dr. Turner at Port Moresby, and by Sayer between there and Mount Obree. These delicate-winged butterflies, which frequent wooded gullies, fly with a soaring motion. Wallace has called attention to the fact that they are remarkable for the habit of settling frequently on the bare earth and on rocks, with their wings spread out and flat, so as fully to display their beautifully pencilled markings. *C. achates* has its wings above greyish-brown, with darker brown light-edged lines, and crossed by a continuous broad white band, which connects with an orange-coloured patch at the anal angle of the hinder one. A submarginal row of black spots is also present. These, which are larger and more distinct on the hind-wing, have, in the latter position, orange rings.

The *Vanessa* group of Nymphalidæ is, again, strongly represented in British New Guinea, as may be concluded from the following enumeration of the species found there, which are referable to it:—*Dolleschallia bisaltide*, Cram., var. (1) *australis*, Feld., (2) *nacar*, Boisd.; *D. comrii*, Godm. et Salv.; *D. dascon*, Godm. et Salv.; *D. dascylus*, Godm. et Salv.; *Precis zelima*, Cram.; *P. tristis*, Misk.; *Junonia vellida*, Fabr. (*Vanessa Iphita*, Cram.); *J. orithya*, Linn., var. *albicincta*, Butler; *Salamis sabina*, Cram. (*Salamis algina*, Boisd.); and (*Pyrameis cardui*, Linn.). The above-mentioned species of the puzzling genus *Dolleschallia* are mentioned since they have been recorded as collected in British New Guinea. It is, however, doubtful whether *D. bisaltide*, Cram. (*Pap. Exot.*, tom. cii., f. c. d.), or, indeed, any of this author's species, occur there. *D. dascon*, Godm. et Salv., and *D. dascylus*, Godm. et Salv., are two species collected by Goldie some thirty miles inland from Port Moresby in 1879, described by Messrs. Godman and Salvin in the *Proceedings of the Zoological Society* for 1880. Regarding the habits of the Thursday Island

species of the genus, Mr. G. F. Mathew informs us that during the hottest part of the day this butterfly flies high and keeps well out of reach, but towards the evening, or when passing clouds obscure the sun, it descends, and then may often be seen at rest on the under-side of a leaf, when it may easily be caught, if one approaches quietly. It is very pugnacious in its habits. One will take up its position on a leaf at the extremity of some lofty branch, and from thence start off and give battle to every passing butterfly, returning, after the encounter, to its original position (*Proc. Linn. Soc. N. S. Wales*, vol. x. 1885, p. 265). Two species of *Precis* have been met with within the Protectorate : one which seems identical with *P. zelima* of the Indo-Malay region and Australia, and the other, which has upon the dull-brown upper surface a transverse row of triangular spots, just beyond the end of the cell of the fore-wing, and a line or series of white specs or spots beyond it, has been named by W. H. Miskin *Precis tristis*. Both of these have been met with in the neighbourhood of the Owen Stanley Mountains by Sir William MacGregor. *Precis zelima* has also occurred at the Fly River, and *P. tristis* at Manu Manu. *Junonia vellida*, Fabr., is a common butterfly in New Guinea. Its immense range of occurrence may be partially conceived from Mathew's statement that he has met with it "at Sydney, Brisbane, Thursday Island, Hobart, New Guinea, Fiji, New Hebrides, New Caledonia, Samoa, Friendly Islands, Rotumah, Gilbert, Ellice, and Marshall Islands" (*P. E. S.*, 1888). *Junonia orithya*, Linn., or rather the Australian variety which Butler has named *albicincta* (*P. E. S.*, 1875, p. 5), also occurs at Port Moresby and in other localities. Its violet-blue hind-wings, with their two large submarginal red black, and blue eye-spots, render this insect especially beautiful. The species of the genus *Salamis*, which terminates the Vanessa group, *S. sabina*, Cram., is a large and remarkably handsome insect. Its wings above are dark-brown, with a broad bright-orange band crossing both, starting from the middle of the fore-border of the anterior wing, and just falling short of the inner border of the hind one. Beneath, they are brownish-grey, with a whitish-pink band corresponding in position to the orange band of the upper surface, and external to this they have a row of eye-spots, with violet pupil and yellow iris, which is rendered conspicuous by a dark band which follows the same direction. The common *Pyrameis cardui*, being such an extensive world-roamer, will, it is presumed, be met with in British New Guinea. It is therefore included amongst the representatives of the Vanessa group already known to occur there.

The *Hypolimnas* group of Nymphalidæ is represented, as far as is at present known, by the well-known insects *Hypolimnas alimena*, Linn., and *H. bolina*, Linn., only, and both these are of common occurrence. The latter is the conspicuous butterfly, of which the male, which is blackish-violet brown, has the large glossy-blue bordered white spots, two on the fore- and three on the hind-wing. It is difficult to decide to which of the species of the "Bolina group," as recognised by Butler and Moore, the New Guinea insects are referable ; nor does it appear that a definite conclusion would be at all reliable, since Mr. G. Mathew informs us that, from a single brood of larvæ found near Levuka, Fiji, he had bred individuals agreeing with varieties from the Gilbert, Ellice, and Marshall Islands, the New Hebrides, New Guinea, Tonga, Samoa, &c. (*Trans. E. S.*, 1885,

p. xxvi.). In addition to these two members of the group, one may expect, with some confidence, to find within the limits of the Protectorate that aberrant species of Fritillary *Argynnis niphe*, Linn., whose recorded habitats include Java, Sumatra, the Philippines, and Australia (although the Australian form is referred to *A. inconstans*, Butler). Also, on similar grounds, *Hypolimnas misippus*, Linn., that strange insect, the male of which, with its blue-bordered white spots, has been mistaken for a small variety of *H. bolina*, whilst its dimorphic female in one of its phases has been regarded as *Danaïs* (*Limnas*) *chrysippus*, Linn., such being the effect of mimicry (*supra*, p. 255).

The Nymphalinae hitherto dealt with are included in Herrich Schäffer's first division of the sub-family. His second section has but few representatives in New Guinea, and these belonging to the genera *Neptis* and *Athyma*, viz., (1) *Athyma praslina*, Boisd.; (2) *A. venilia*, Linn.; (3) *A. lactaria*, Butler; (4) *A. cyanifera*, Butler; (5) *Neptis woodlarkiana*, Montr.; and (6) *N. consimilis*, Boisd. Of these, it is thought that No. 3, collected on the mainland by Dr. Comrie during the voyage of the *Basilisk*, and No. 4, obtained by Dr. Turner at Port Moresby, will prove to be identical with *Athyma venilia*, Linn. *Neptis woodlarkiana* was collected by Montrouzier at Woodlark Island, and described in *Ann. Sc. Phys. Nat. Lyons*, 1856, p. 406. It has not since then been identified. All the Nymphalidæ in these sections occur in Queensland. They are very delicate insects, with the wings blackish-brown above and lighter beneath, and marked by white blotches and spots, which in *A. venilia* are surrounded by borders of pale-blue scales. *Neptis consimilis*, however, is of rather a different type, the markings comprising a broad light-orange band on each side, and a detached apical blotch of the same colour in the fore-wing. It flies in a very airy manner, giving three or four flaps with its wings, and then floats gracefully to a leaf, where it settles with wings fully expanded (Mathew).

Fam. Lemonidæ.

Sub-Fam. Nemeobiidnæ.

This family is at present represented in British New Guinea by but a single species, *i.e.*, *Taxila decorata*, Hew., an insect which has so far been collected only on the Fly River (Froggatt) and on the St. Joseph (C. Hedley). This butterfly, which expands to rather less than two inches, has in the male the wings above brick-red, becoming outwardly darker, with black spots along the external border. The fore-wing is also crossed very obliquely in the middle by an orange band and with black spots along the outer border. In the female the wings above are orange-yellow, outwardly passing into dark-brown. The under-surface of *Taxila decorata* is especially gay-coloured, being orange-yellow with the apical third of fore-wing and blotches on hind-wing rufous-brown. In addition, there are white spots of different size, and small silvered spots and elongated stripes, the latter restricted to the external border of the hind-wings. *Taxila* contains but few species, and these belong to a small family which attains its highest development within the tropics of the New World.

The family *Eurytelidæ* is represented in British New Guinea but by one

insect, the *Elymnias aginodas*, Boisd. (*Dyctis aginodas*, B.), and this appears to be of rare occurrence. It was obtained near Najat, in Hall Sound, by D'Albertis, and more recently by C. Hedley, at Aipiana, in the same district. It is a velvety-black or very dark-brown insect, with ample rounded wings. Its fore-wings are olivaceous externally, and the hind ones have along their external border a broad orange band, which is more distinct at the anal angle. On the under-surface this orange band forms a prominent feature, and contains two eye-spots, one of which has two violet pupils. The male insect—to which the above description relates—has very much the appearance of a *Euplaea*. The female butterfly, on the other hand, as Wallace informs us, wonderfully resembles *Drusilla bioculatus*, (Guér.), one of the *Morphidæ*, and has indeed been confounded with it by no less an authority than Westwood (*Gen. Diur. Lep.*, p. 354, pl. 54*, f. 4). This resemblance is further aided during life by their flight being slow, as in the *Morphidæ*.

Fam. **Lycænidæ.**

The "Blues" of British New Guinea are individually numerous and present in great variety. They occur everywhere, the finer species, belonging to the genera *Amblypodia*, *Danis*, and *Hypochrysops*, being more or less restricted to openings in the denser forests. Many of the species are also found in other countries, the north-east coast of Australia being especially rich in species which also occur in New Guinea. In this connection may be mentioned *Danis alcuas*, Feld. ; *D. sebæ* ; *Lampides onejus*, Fabr. ; *L. strabo*, Fabr. ; *L. alsulus*, Her. Schf. ; *Hypochrysops epicletus*, Feld. ; *Pseudodipsas ilius*, Feld. ; *P. lycænoides*, Feld. ; *Hypolycæna phorbas*, Fabr. ; *Amblypodia micale*, Blanch., all of which occur in Queensland. Amongst other species from British New Guinea may be mentioned *Danis hymetus*, Feld. ; *D. nemophila*, Butler ; *Lampides cayaya*, Feld. ; *Lycæna nemea*, Feld. ; *L. beroë*, Feld. ; *L. labradus*, Godm. ; *L. pallida*, Misk. ; *Cupido hylas*, Cram. ; *C. lorquini*, Feld. ; *Pithecops dionysius*, Boisd. ; *Holochila intensa*, Butler ; *Appias delicata*, Butler ; *Hypochrysops protogenes*, Feld. ; *Hypolycæna tmolus*, Feld. ; *Amblypodia obscura*, Misk. ; *A. azema*, Hew. ; *A. axone*, Hew. In addition to these there are other species, which, from their known range of geographical distribution, may be expected to occur within the limits of the Protectorate. Foremost amongst these are *Lampides bæticus*, Linn.

Fam. **Papilionidæ.**

Sub-Fam. **Pierinæ.**

Numerous representatives of this sub-family are met with in the Protectorate. The Small Yellows occurring there are *Terias hecabe*, Linn., an insect which is met with in India, South Africa, Australia, and Oceania, *T. puella*, Boisd., and *T. virgo*, Wall. The two latter species have each a broad outer marginal black band. In the first mentioned of them the two sexes are similarly coloured, but in *T. virgo* (as W. H. Miskin has pointed out) the female is white instead of being bright golden-yellow. The Small Whites commonly met with are *Elodina andropis*, Butler, and *E. pallene*, Hew. The latter, which has the tips and outer

borders of the fore-wings black, is doubtless closely allied, if not identical with, the Australian *E. angulipennis*, Luc. Other Pierinæ to be mentioned in this connection are *Pieris* (*Blenois*) *peristhene*, Boisd. ; *P.* (*Blenois*) *teutonia*, Fabr. ; *P.* (*Blenois*) *scyllara*, var. *nabis*, Luc. ; *P.* (*Blenois*) *latilimbata*, Butler ; *P. ornytion*, Godm. et Salv. ; and *P. pitys*, Godart. Most of these are insects which may be met with in almost countless numbers, forming often migratory hosts ; some of them are, it seems, only local forms of other wide-ranging species ; all, it is probable, as is known to be so in the case of *P. teutonia* and *P. scyllara*, subsist during the caterpillar phase on species of *Capparis*. *Pieris celestina*, Boisd., seems to be the only species of *Tachyris* which collectors seem to have hitherto met with. It is possible, however, that the rare *T. melania*, Fabr. (nec. Boisd.), known to occur at Cape York, may yet also be met with in Southern New Guinea. *T. celestina* was met with by Sir William MacGregor during his celebrated visit to the Owen Stanley Mountains. It is bluish-grey above, with the apex, outer margin of the rather pointed fore-wings, and spots towards outer border of both wings black. On the under-surface it is ashy-pearl coloured, with the costa yellow. Oberthür relates concerning it, that "it flies along the sea-border and settles on the still humid sand ;" that "it is extremely shy, and flies off upon the least disturbance with extreme rapidity, and so disappears." The above description relates to one sex only ; the opposite one is stated to be quite different. All the specimens that have come under the notice of the writer are referable to a single sex. This preponderance of one sex, usually the female, is noticeable also in Australian species of the genus, notably in *Tachyris asterias*, Misk., of North-Eastern Queensland. The scrub-loving Pierinæ are represented by *Delias mysis*, Donovan, *D. cruentata*, Butler, and *D. inferna*, Butler. The first mentioned of these was, according to Oberthür, obtained by D'Albertis at Mount Epa, Hall Sound. *D. cruentata*, Butler, is usually, however, regarded as the New Guinea form of this Australian species, and certainly occurs in the valley of the Fly. The third mentioned butterfly is a remarkable Pierid allied to *P. aruna*, Boisd., described in the *Faune de l'Océan Pacifique*. The male is bright orange-coloured on the upper surface, with the fore-border of the front wing, and a broad band across its apex, and the external margin of the hind-wing black. The female, on the other hand, is black, with the basal half of front-wing orange, and base of hind-wing light-yellow. Both sexes have the under-surface dark clay-brown, with a short oblique scarlet bar at the base of hind-wing. *Delias inferna* is met with at Cape York, and is probably the insect recorded under the name *P. aruna*, Boisd., by Masters as occurring in that locality. *Callidryas* has also its representatives in the Protectorate, and all the New Guinea species of this genus, inasmuch as they exhibit in the male sex "a well-developed brush of silky hairs towards the base of the inner margins of the hind-wings," belong to the sub-genus *Catopsilia*. The allied sulphur-yellow butterflies *Catopsilia crocale*, Cram., and *C. catilla*, Cram. (? *C. pomona*, Fabr.), are both commonly met with. These butterflies have each a very extensive range of occurrence, being found in India, the Malay Archipelago, and Australia. *Catopsilia flava*, Butler, has also been recorded as having been collected by D'Albertis in Hall Sound, but it is probably identical with the last mentioned, *C. catilla*, as suggested by D'Albertis.

Judging, too, from the habitats which have been assigned to these species, it is highly probable that *Catopsilia lactea*, Butler, *C. gorgophone*, Boisd., *C. pyranthe*, Linn., and *C. chryseis*, Drury, will be obtained in British New Guinea. These insects have all been met with in Queensland, and *C. gorgophone*, Boisd., as near as Thursday Island (G. F. Mathew).

Sub-Fam. **Papilioninæ.**

That the Malay Archipelago is very rich in Papilionidæ has long since been shown by Wallace. This distinguished naturalist pointed out in 1866 that there were as many butterflies belonging to this family in that region as in the whole of South America, a statement which he, however, qualified in calling attention to the liberal interpretation which writers on New Guinea, including himself, had placed on the meaning of the term "species" when considering local varieties of well-known types. New Guinea is indeed proportionately well endowed. Perhaps the most superb of this is the *Ornithoptera* of the *O. priamus* type, which has received so many different names, *O. poseidon*, Doubl. This is quite a scrub insect, and may be met with wending its way through the undergrowth, or more commonly soaring aloft amongst the tree-tops. The rapture with which one gazes upon this insect for the first time may be inferred from a perusal (in "Malay Archipelago," p. 335) of Wallace's description of his introduction to *Ornithoptera Cræsus*, or of Gervase F. Mathew's account (*Proc. Ent. Soc.*, 1888) of his first meeting with *Ornithoptera durvilliana*. The lively contrast between the yellow of the hind-body and the bright-green and velvety-black of the wings of the male insect, and the large proportions—the wing-expansion being from six to seven inches in the moth-like female—so different in appearance in its plain colours of black blotched and spotted with more or less dusky white, at once claim the attention. Oberthür has called attention to the coppery reflections which pervade the green parts of the wing in the New Guinea insects. This representative of the *O. priamus* group of *Ornithoptera* is met with along the entire coast, both on the mainland and on the islands adjacent. D'Albertis found it abundant at Yule Island at the commencement of September, and also during March and April, but scarce during the intervening months. It is not always easy to capture, the above-mentioned explorer having had to resort, as Oberthür informs us, to the shotgun in order to obtain specimens. The natives are fully alive to its beauties, and in places secure it with some adroitness. The writer, moreover, has been informed by Charles Hedley that towards the East Cape they fasten the splendid males, still alive, in their hair. G. F. Mathew informs us that the velvety-black larva of this insect attains a length of from 55 to 60 mm.; that it is comparatively short and obese, its central segments being especially thickened; that its maxillary tentacles are carmine-coloured, and that this colour broadly encircles the eleven fleshy dorsal spines which in it form so conspicuous a feature.

The genus *Ornithoptera* is represented in British New Guinea by a yet more interesting species, one belonging to another—the *O. pompeus*—group, an insect which may be regarded as a form of *O. helena*. No previous notice (except one due to the present writer) of the occurrence of this remarkable group in British

New Guinea has been met with, but Wallace has named as a variety of *O. helena* a female insect procured at Salawatti with the designation "*papuensis*" (*Trans. Linn. Soc. Lond.*, 1866, pp. 38-39), at the same time expressing an opinion that when the male is discovered it will probably demonstrate the existence of a well-marked species distinct from any yet known. The correctness of this anticipation seems to be verified by the light thrown on the question by specimens procured by Sir W. MacGregor at Kiwai Island, just within the mouth of the Fly River, and by C. Hedley at the St. Joseph River (Hall Sound) and at Doura. This scrub butterfly must be especially attractive in life. In both sexes the fore- and hind-wings are sooty-black on the upper surface, but the latter have a large triangular light brassy-yellow patch occupying their centres, *with a conspicuous narrow extension towards their apical angles*. This patch, which is conspicuously intersected by the black veins, is angularly excavated in the male, and roundly excavated in the female.¹ In the latter sex also, on the under-side, the veins of the fore-wing have broad ill-defined bands of ashy scales, and the discal patch of the hind-wing is cream-coloured. In both sexes there is a sanguineous colour and pectoral spots, the abdomen is yellow, but above brown banded with cream colour, and has a lateral row of yellow spots. These yellow *Ornithoptera*, as they have been termed, range from India through the Malay Archipelago; but whether their eastern extension is much beyond that indicated is at least doubtful. For beauty, however, perhaps, *Papilio ulysses*, in its variety "*P. penelope*," stands unrivalled amongst New Guinea butterflies. Concerning it Oberthür has penned the following passage (of which a translation does but convey a faint image):—"By its admirable blue colours, set off by a frame of velvet-black, *Papilio penelope* can sustain comparison with the most brilliant *Morphos* of Tropical America. One often comes across the lovely butterfly, flying usually in pairs above the mountain torrents, which it ascends and descends in alternate movements." Wallace relates of the typical *P. ulysses* that "it flies with a rather weak undulating motion, and from its large size, its tailed wings, and brilliant colour, is one of the most tropical-looking insects that naturalists can gaze upon." This "magnificent metallic-blue and black-bordered" butterfly, as Mathew styles it, usually mounts high amongst the trees, soaring and flying rapidly to and fro, flashing its shining blue upon all around. K. Broadbent, who accompanied Stone's expedition, remarked that it seemed often to frequent and follow definite tracts in the scrub, especially such as are afforded by rocky watercourses overhung by the neighbouring trees and scrub. Also that on these occasions it settled low to quaff the nectar from some flowering vine. *Papilio telemachus*, Montr., which Montrouzier procured at Woodlark Island, is another "*Ulysses*," like *Papilio*, which is said to have less blue upon its wings than the typical insect of Amboina and Ceram.

¹ By an oversight the writer has stated that "the second female, from Doura, corresponded, in the disposition of colour of the fore-wings, to the insect figured by Cramer" (*Pap. Exot.*, tom. xxv. 4); whereas the female accords with Wallace's description of "*O. papuensis*." Cf. "*Rhopalocera* Collected in British New Guinea during 1889-90," p. 2, 1890.

The members of the *P. helenus* group which represent *P. capaneus*, Westw., in British New Guinea, occur very commonly from Hall Sound to East Cape, and are even represented at Dinner Island (Samarai). Butler states that the New Guinea insect is distinct from the typical *P. capaneus*, Westw. (from Australia), and names it *P. indicatus*. Again, Messrs. Godman and Salvin have designated another form obtained by Goldie inland from Port Moresby as *P. lesches*. On the other hand, Oberthür cannot distinguish a female insect from the Dependency from the female of the typical species. Specimens which have come under the writer's notice from Dinner Island have the intro-marginal light-coloured band on the fore-wings above as in *P. capaneus*. As contributing to the explanation of the somewhat wide range of occurrence of this insect, we may quote G. F. Mathew, who remarks: "At Port Moresby, in New Guinea, it (*P. indicatus*, Butler) was one of the most abundant species during our visit in November 1884. . . . One day while we were at anchor (we were nearly two miles from the landing-place), a constant stream of butterflies passed the ship, flying across the harbour from south-east to north-west, the harbour being from three to four miles wide. Many thousands passed during the day, and three-fifths consisted of this species."

The handsome *Papilio erectheus* of Australia, the type of a group distinguished by the fact that the females occur in two or three distinct forms, is probably represented in New Guinea alone by forms which, amongst other differences, exhibit a much greater development of the light colour of the wings that is presented by it. Gervase Mathew states, however, that he collected *P. erectheus*, Don., at Port Moresby, and Butler records that Dr. Comrie obtained it during the voyage of the *Basilisk* on the mainland also. Specimens of the group collected at Port Moresby, and now before us, belong to *P. ormenus*, Guér. A less common form than *P. ormenus* is *P. enchenor* of the same author (*P. enchenor*, Boisd.), an insect which is met with from the Fly River to Milne Bay. This butterfly has a wing-extension of nearly four inches, and is very handsome, being black, with a broad, very much externally-dentated, sulphur-yellow band crossing both pairs, and a small linear series of spots of the same colour within the apical angle. The female insect is generally very similar to the male, but has on the hind-wings a red spot and lunules towards their anal angles. At certain times of the year the Australian *Papilio erithonius*, Cr., is commonly met with in the open country. This butterfly is remarkable by reason of its unusual feeding habits. Mr. Gervase Mathews, who has described the larva and reared a fine series of imagos, states that it feeds upon a species of *Salvia*. Dr. G. Bennett, however, informs us that it is one of the lepidopterous insects whose caterpillar is destructive to the foliage of the orange (*vid.* "Gatherings of a Naturalist," p. 313, Lond., 1860, and Essay, "Introduction of Orange in New South Wales, Sydney," 1871). Two of the most noteworthy of the Papilios are, however, *P. thule*, Wallace, and its ally, *P. Goldiei*, Godm. et Salv., the former occurring in the Fly River district, and the other inland from Port Moresby. These, both in their form and colouring, depart strangely from the typical Papilios, mimicking in a remarkable degree species of Danais. Not only have the hind-borders of their fore-wings been unduly lengthened and the external one excavated in the

accomplishment of this result, but the general pattern of wing-marking is quite anomalous. In the case of *Papilio thule*, *Danaïs sobrina*, Boisd., is the insect the object of imitation. Both insects are nearly black, and have greenish-white blotches disposed in obliquely transverse rows and spots in marginal series. Both frequent the same localities and are found in company. The rare swallow-tail butterfly, *Papilio parmatius*, Gray, has been obtained at one spot only in British New Guinea, viz., the Fly River. The strong-flying Papilios, constituting the *Eurypylus* group, are represented by the common *Papilio agamemnon*, Linn., and by the green-spotted butterfly. Both these insects have a very extensive range, even occurring beyond the Indo-Malayan and Austro-Malayan regions. The latter flies high and is consequently obtained only with difficulty.

The genus *Eurycus* is represented by an ally of the Australian *E. cressida*, named *E. troilus* by Butler, in which the females are relatively dark-coloured. It has been met with in grassy gullies about Port Moresby and towards Mount Obree.

Fam. **Hesperiidæ.**

The "Skippers" seem to have very generally escaped the attention of collectors, doubtless owing to their more or less solitary habits and rapid movements. The majority of the species, too, recorded as occurring there have a wide range of occurrence, being met with in India and Australia. In this connection may be mentioned *Carystus cæsina*, Hew., *Pamphila mathias*, Fabr., *P. angias*, Linn., *P. olivescens*, Her. Schf., and *P. flavovittata*, Latr., all of which insects may be procured in Queensland, the type of the last species having been procured in Sydney, New South Wales. In addition to these are *Ismene strophinus*, Misk., *Plesineura renardi*, Boisd., and *Tagiades menaka*, Moore. Skippers found both in India and Queensland, and which it is therefore probable will be met with in British New Guinea, are *Casdon*, Cram., *Chromus*, Cram., *P. bambusæ*, and *Gamalia albofasciata*, Moore.

Sub-Order : **Heterocera** (Moths).

In August 1889, E. Meyrick, in a paper entitled, "On Some Lepidoptera from New Guinea" (*Trans. Ent. Soc. Lond.*, 1889, pp. 455-522), described or enumerated 175 species of Moths from British New Guinea, these having been comprised : (1) in a collection received from Baron von Müller, K.C.M.G., F.R.S., &c., made by Sayer on Mount Obree and the adjoining ranges, when accompanying Cuthbertson's exploring expedition ; and (2) a collection, principally of Geometers and Pyrales, received from Lord Walsingham, and collected by C. Kowald near Port Moresby. Prior to this event, our knowledge of the British New Guinea moths was meagre indeed, being almost confined to the fact that there existed there two species of *Nyctalemon*, and one or two species belonging to the families *Syntomidæ* and *Hypsidæ*. Other portions of New Guinea are in the same case, for Oberthür's list of thirteen different kinds of Heterocera procured at Dorei is a very small contribution to the subject, though otherwise interesting. Mr. Meyrick describes seventy-five new species, and for a large proportion

of these, new genera have been necessarily formulated. His paper has, however, an additional interest, owing to the fact that it indicates a direction in which further discoveries may be made. It has long been remarked that the moths of the tropical seaboard of North-East Australia mainly comprised Indian species, and we now, in this memoir, have evidence that British New Guinea is one of the stepping-stones between these two countries, and we are thus in a position to predict that insects now known to be common both to India and Queensland will be met with in British New Guinea also. Thus may we expect to find there, to mention only a few of the Hawk-moths common to India and Australia, *Protoparce orientalis*, Butler, *Daphis nerii* (Linn.), *Xylophanes oldenlandiæ* (Feld.), *Theretra nessus* (Drury), *Panacra vigila* (Guér.), *Cephonodes hylas* (Linn.), *Sphinx anceus*, Cram. The following, amongst many other instances of moths common to India and British New Guinea, occur to the writer in passing in review the earlier species mentioned in Mr. Meyrick's enumeration. Additional instances are given by the author himself. Sphingidæ: *Deilephila celerio*, L. Arctiidæ: *Spilosoma marginata*, Don.; *Deiopeia pulchella*, L. Hypsidæ: *Nyctemera cribraria*, Cl. Liparidæ: *Orgyia postica*, Walk. Noctuæ: *Hulodes caranea*, Cr.; *Ophideres fullonica*, L.; *Achæa meliceite*, Drury; *Remigia frugalis*, F.; *Simplicia cœnealis*, Walk., &c. To revert, the list contains the following names of Australian Noctuæ: *Acontia nivipicta*, Butler; *Grammodes alterna*, Walk.; *Sericia diops*, Walk.; *Phlegetonia conspicienda*, Gu.; *Lophoptera squamigera*, Gu.; *Britha biguttata*, Walk.

VI.

ORDER: RHYNCHOTA.

Sub-Order: **Heteroptera.**

British New Guinea is richly endowed with Hemipterous insects, but only the more handsome and the larger species seem to have been collected there by naturalists. The literature relating to them is almost wholly confined to what C. Staal, W. S. Dallas, F. Walker, Snellen van Vollenhoven, Dr. Signoret, and W. L. Distant, have written on the subject; special reference being made to C. Staal's *Hemipterorum Exoticorum Generum et Specierum Nonnullarum Novarum Descriptiones* (Trans. Ent. Soc. Lond., 3 Ser. i. 1862-64), his *Enumeratio Hemipterorum*, published in the *Kongl. Svenska Vetenskaps Akademiens Handlingar*, especially Parts 3 and 4 (1873-74), and to F. Walker's "Catalogue of Hemiptera Heteroptera in the Collection of the British Museum," Parts i.-viii., 1867-73. The latter publication is especially important, as it deals with Dr. Wallace's extensive collection of these insects, both those obtained directly from this distinguished naturalist and those belonging to Mr. Wilson Saunders. Dr. Signoret's paper is contained in the *Annali del Museo Civico di Storia Naturale di Genova*, and relates principally to the Hemipterous insects obtained by Beccari and

D'Albertis. The most recent paper, however, is that of W. L. Distant, which deals with Rhynchota, which, "though few in number, are of great interest," collected by Mr. Sayer in the neighbourhood of Mount Obree during Cuthbertson's expedition. This is included in Part iv. of the *Transactions of the Entomological Society of London* for 1888. In addition, the older writers, notably Guérin and Boisduval, have described a few Papuan species. Amongst the Heteroptera attention may be directed to the *Pentatomidæ*, as including many conspicuous insects. In the section *Scutellerinæ*, the group of which *Calliphara dimidiata*, Dall., may be regarded as the type, is represented by a "tree-bug," ten lines in length, which is glossy violet-black with green reflections, and has a broad bright-red band encircling the body. This, or perhaps an allied insect from Woodlark Island, Montrouzier justly designated "*splendida*." The same section is again represented by *Chrysocoris sexmaculatus*, Leach, a red insect (green in certain positions) with purple-black spots or blotches, six of which are contained upon the dorsal shield (scutellum). The *Halydidæ* find their more common representatives in species of *Spudæus* and allied genera. These insects, which have very prominent eyes, are brown or brown varied with green, and have often a sharp lateral spine directed outwards from each side of the thorax. Amongst the *Pentatominae* occurs an insect measuring about ten lines in length, which is glossy and bright-red, and which has the head and three large spots on the wings steel-blue. Perhaps the largest of land *Heteroptera* occurring in British New Guinea is an insect belonging to the family *Edessidæ*, viz., *Oncomeris flavicornis*, Boisd. This "tree-bug" measures $1\frac{1}{2}$ inch long and $\frac{3}{4}$ inch broad. It is black with bronze reflections. The wings have their opaque portions red with a black medium bar, and their membranous portion brown with coppery reflections. The stout abdominal spine directed forwards beneath is not the least conspicuous feature in this splendid insect. The *Megymenidæ* are represented especially well by several species of *Megymenum*. Amongst these is the *M. dentatum*, Boisd., a very remarkable insect, having the sides of the prothorax produced into long anteriorly directed flat lobes. Most of the species are dull dark-brown with the membrane of the wings clouded with creamy-white. One New Guinea species which has no thoracic lateral extensions has a purplish-coppery sheen on the thorax. The *Coreidæ* are, again, like the *Pentatomidæ*, very numerous. A common insect is *Mictis profana*, Fabr., a large brown insect, in which the light bands bounding the inner sides of the corium of the anterior wings form a cross upon the back. Equally rich in species are the allied families *Lygæidæ* and *Pyrrocoridæ*, the latter family being especially well represented by numerous species of the genus *Dysdercus*, one of which, *D. congulatus*, Fabr., is not to be distinguished from a Queensland insect. The Nudirostræ or predaceous "tree-bugs" have their commonest representatives in species belonging to the genera *Pristhesanchus* and *Helonotus*, remarkable for having prominent tubercles arising from both the head and thorax. One species of the former genus is a common Queensland insect, and inflicts a painful wound when carelessly handled. It is, doubtless, an insect referable to the *Reduviidæ*, to which D'Albertis alludes in the following statement:—"The young of a species of bug live on the same plant as the green ants which I have mentioned, and so closely resemble them that they

can only be distinguished from the ants after attentive observation. There is no doubt that these bugs escape many of their enemies by their likeness to the ferocious and pugnacious insect. In colour and form they are perfect copies" (*New Guinea*, i. p. 229). The division of Heteroptera comprising the aquatic insects *Hydroconia* presents us, again, with many New Guinea forms. In the family *Naucoridae* we have the well-known *Belostoma indica*, attaining a length of $2\frac{1}{2}$ and a breadth of 1 inch, and the much smaller *Naucoris scutellaris*, Staal, both flattened insects; also those curious insects which breathe through long anal filaments, the boat-shaped *Ranatra*, and the attenuated *Nepa*. These are predaceous aquatic insects. The other families are represented commonly by a species of *Notonecta*.

Sub-Order : **Homoptera.**

This large group of insects, comprising, amongst others, the tree-hoppers (the *Cicadidae*), the plant-lice (*Coccidae*), and Aphides, forms a considerable element in the insect fauna of New Guinea. Again we have to refer to the works of F. Walker, Staal, Atkinson, and especially to those of W. L. Distant; the first-mentioned authority being the author, not only of the "List of Homoptera in the British Museum" (1850), but of several papers in the early volumes of the *Proceedings of the Linnean Society of London*, in which Wallace's collection of Homoptera from the Malay Archipelago is dealt with. Distant in the *Annali del Museo Civico di Genova* for the year 1888 has dealt with D'Albertis' discoveries, as also those of Beccari. Staal's papers are contained in the *Entomologische Zeitschrift* of Berlin for 1866 and the *Ofv. Vet. Ak. Fort.* for 1870, and as they largely deal with Semper's discoveries in the Philippines, throw considerable light on the New Guinea Homoptera. Atkinson's papers on Malayan Homoptera are to be found in the *Journal of the Asiatic Society of Bengal*. The *Cicadidae* are forming the subject of a special work, "A Monograph of Oriental Cicadidae," by W. L. Distant, much of which is already before the scientific world. The present writer has such little acquaintance with the insects of this Order, that an apology for passing it over with those particulars only is perhaps superfluous.

VII.

ORDER : DIPTERA.

The Diptera of British New Guinea have not as yet been systematically collected, much less described. We can, however, get some insight into its nature by studying the several papers by Francis Walker relating to the insects of this Order obtained by A. R. Wallace during the travels of the latter in the Malay Archipelago. These are contained in the Zoological Series of the *Proceedings of the Linnean Society of London* issued in the years 1857-68 inclusive; and amongst their number the one entitled "Synopsis of the Diptera of the

Eastern Archipelago, discovered by Mr. Wallace, and noticed in the Journal of the Linnean Society" (*Proc. Linn. Soc. Lond., Zool.*, vol. ix. 1868), is of especial interest. Visitors to British New Guinea, however, complain of the mosquitoes, the sand-flies, or the blow-flies which occur there. Mr. K. Broadbent, the well-known naturalist, who accompanied Mr. O. C. Stone's expedition in 1875, remarks that the flies which troubled him most were the "blow-flies," a large variety of "blue bottle." These insects deposited their eggs, amongst other places, on his bird-skins soon after they were put to dry, filling the plumage of these latter with eggs, which, if left undisturbed, shortly gave birth to maggots. During January, February, and March he noticed also that the mosquitoes were very troublesome in scrubby country, even during the daytime. D'Albertis, in writing of his experiences at Yule Island, states: "Small insects, such as gnats and sand-flies, are much too abundant, and are a continual torment. There are day-gnats and night-gnats, of all colours and of all sizes. The sand-flies are our next greatest enemies, and they penetrate through everything. They make their appearance during the first days of the new moon" (*New Guinea*, i. p. 404). F. A. N. Skuse has shown that the sand-fly of Australia is a *Ceratopogon* (Fam. *Chironomidæ*), and not a *Simulium* (Fam. *Simulidæ*), as in other countries. It would be interesting to note the nature also of the New Guinea species. Some of the more interesting of the parasitic Diptera are known to occur in New Guinea. C. Rondani has described as found there *Ornithomyia andajensis*, *O. hatamensis*, and *Olfersia papuana*, amongst the *Hippoboscidæ*; but unfortunately Beccari, to whose efforts these insects are due, has not recorded the names of the bird-hosts whence these parasites were derived. The curious degraded *Dipteron*, *Nycteribia*, is found upon the "Flying Fox" (*Pteropus* sp.), as in other countries.

IV.

REPTILES OF NEW GUINEA.

By C. W. DE VIS, M.A., CURATOR, QUEENSLAND MUSEUM.

THE bounds of New Guinea are defined by the geographer with a degree of uncertainty of which agnosticism might be proud. Proceeding, as is his wont, to include within them the satellite islets lying around, he at once finds himself in perplexity. Outside his line, wherever drawn, east, south, and west, lie other islets as near to those within the line as these are to the coast. If, to surround them, he corrects his boundary, it is only to discover that he is still in the same predicament; he finds at last that he must either restrict New Guinea absolutely to its coast-line, a limitation which seems absurd, or place in its embrace the Solomon Group, the Louisiades, and the southern and western islands to Australia and the nearest Dutch dependency, an extension which is absurd. From this dilemma he is rescued by the statesman and the zoologist—the former, with whom political expediency is the one consideration, calmly maps off the whole of Torres Straits, appropriates it to Australia, and then bestows the Louisiades upon New Guinea; the latter points out that while certain islands and groups of islands—as, for example, the Aru Islands, Kei Islands, and Waigiou—belong to New Guinea naturally, by virtue, that is, of the close resemblance existing between their organic productions and those of the greater island, others, as the Moluccas, Louisiades, and Solomon Islands, must be considered foreign to New Guinea, by reason of the absence of such preponderating resemblance. Under the guidance of this principle the naturalist traces a boundary-line which comprehends the one class and excludes the other, carrying it, in defiance of statecraft, through Torres Straits itself. On the west he finds his judgment confirmed by the coincidence of the line separating the Papuan Islands proper from those of the Eastern Archipelago, with the contour of the sea-bottom at a depth of a thousand feet. As it is from a zoological point of view we have, for our present purpose, to regard the island, we cannot do better than accept this definition of it, for, unless we understand clearly what we mean by New Guinea, our conception of its reptilian fauna will necessarily be wanting in precision.

New Guinea lies within the first ten degrees south of the Equator. In its lowlands, hot, humid, and jungle-clad, it should in all propriety swarm with reptilian life. Rivalling Brazil, Africa, and India in its wealth of birds and butterflies, it should not be inferior to them in the number, size, and variety of

its reptiles ; but what "should be" is exactly that which should be most distrusted. In the present case, preconception exposes itself to such opprobrium by taking account of temperature, moisture, and fertility, three very powerful factors of animal organisation, but overlooking a very efficient check upon its uniform distribution,—insularity. The co-existence in an insulated region, however favourable to the development of life that region may be, of the several classes of the Vertebrates, in the proportions met with on continental areas, is so far from being a proposition commending itself to reason, that when once we have duly estimated the facilities possessed by the several classes of gaining access to islands, and their submissiveness to the modifying influence of insular conditions, we see that it can only be true exceptionally, if at all. Birds we find everywhere, for they are creatures of insatiate capacity of diffusion and irrepressible power of adaptation. Batrachians, on the other hand, and Lizards among the Reptiles, for the most part, can only obtain admittance to islands by accidental means of the rarest kind ; while other Reptiles, such as fresh-water turtles and snakes, carried out to sea by floods, have better chances of effecting a landing on distant islands. But with far less natural ability to cross wide tracts of sea, Reptiles have also less flexibility than Birds under the stress of their common environment, and, as a consequence of these interacting checks, will appear in an island in much less variety. Mammals, again, have no greater facilities of transport than Reptiles ; less, indeed, if we except those species which have been diffused by the restless migrant of the human period, and still less readiness have they to take on new forms when confined within a limited range of surface. It is only on the greater continents that mammalian life is largely represented in species, and it is in these only that we observe no conspicuous dearth, either of Mammals, or of Reptiles, or of Amphibians. Apart from mere insularity, there are, of course, other conditions largely influencing the extent or composition of an insular fauna,—distance in space from the nearest continuous land, exposure to the impact of currents, ærial or aqueous, distance in time, or the length of the period during which intercourse with a continent has been interrupted. This is not the place to discuss matters so fertile in thought, but to show how space and time may be called in to explain phenomena of animal distribution, we may compare in a tabular statement the faunas of Australia, New Guinea, and New Zealand ; Australia being distant both in space and time from the rest of the world, the other islands more or less so from Australia or neighbouring islands:—

Country.	Space and Time.	Mammals.	Birds.	Reptiles.
Australia . .	...	Moderate number, peculiar type. in but in	Moderate number, a few peculiar.	Moderate number, rarely peculiar.
New Guinea .	Approximate in space and time.	Few.	Numerous, many peculiar.	Moderate, rarely peculiar.
New Zealand .	Distant in space and time.	Very few.	Moderate, some very peculiar.	Very few, one very peculiar.

The purpose of the foregoing remarks has been served if it should now appear that to conceive New Guinea to be a place overrun with Reptiles would be to allow the imagination too much liberty. As a matter of fact, the island is rather scantily furnished with them, whether we look for variety of form or number of individuals. True, it is not fully explored, but its loftier regions still untrodden are not likely to work much change in our estimate.

As we may suppose, the present Reptilian fauna of New Guinea appears to have been derived from other lands ; in origin it seems to have been mostly Australian, partially Asiatic ; in its existing stage it is the result of specific changes brought about by conditions which have endured in isolation long enough to metamorphose the majority of the species, but not long enough to produce, in many instances, those further changes which give rise to genera and families. It possesses but one group of reptiles which has the distinct savour of antiquity, the Varans or Monitors, and this it doubtless derived from Australia previous to separation. To this group we shall have occasion to return.

Roughly speaking, New Guinea stands in the angle formed by two converging currents of modern dispersion,—one setting slowly and fitfully with eddies and return currents from the east, the other of like character from Australia. These have brought to it for ages whatever could, by chance, become flotsam on the intervening island-studded waters, and whatever of the jetsam proved fit for survival it retained. By return currents, a few reptiles, after undergoing modifications which constituted them New Guinea species, may have occasionally travelled back towards their original home ; but before the island became separated—while yet there was nearly continuous land from India to South Australia, while New Guinea formed the grand promontory of an Australasia, parted only by narrow straits from an extended Asia,—it no doubt received its share of such Asiatic immigrants as were capable of passing the straits and finding suitable lodgment in its cool highlands or tropical valleys amongst the Australian indigenes then tenantry them. Isolated by the subsidence which delivered the foundations of the Eastern Archipelago to the waters of the Pacific, and lower down to the channel of Torres Straits, this ancient stratum of the Papuan fauna has persisted, and this stratum, slowly changed and slightly mingled with such modern introductions as could accrue in spite of difficulties, constitutes the New Guinea fauna as it now presents itself in its reptilian aspect.

The Reptiles of New Guinea are an assemblage of representatives from each of the four orders in the constitution of the class, Crocodiles, Turtles, Lizards, and Snakes.

In the foreground lies the Crocodile, first in organic rank, unrivalled in power, and with ferocity equal to the power to gratify it. This is the fluvio-marine species *Crocodilus porosus*, than which few reptiles possess a more ample domain, few occupy and harry it more effectually. It extends its reign from China to Persia, from the coast of Asia to the Solomon Islands, and southward at the present time to $23\frac{1}{2}^{\circ}$ lat. ; on the Queensland coast to $25\frac{1}{2}^{\circ}$, where the blacks were its only antagonists. Dr. Gray, in his "Catalogue of the Crocodilia," calls this species the Salt-water Crocodile, and if the intent were merely to distinguish

it from Crocodiles which never willingly see salt water, the name might stand ; it is, nevertheless, equally at home in fresh and salt water. It constructs its nest on the banks of tidal rivers [the writer once had a long interview with a female; who, without permission, had placed her nest on his share of a river bank ; he was unarmed—she did not know it—and each told the other to go away and leave those eggs], and ascends them far inland, wherever fish and other prey, including man, are plentiful. By a curious and hardly excusable mistake, Dr. Gray makes the explorer Landsborough say of this crocodile, "Harmless as this animal is in Australia," &c. Landsborough knew the coast Crocodile too well to have any such remarkable opinion of it. In the passage quoted he is speaking of the fresh-water Crocodile of the Queensland tableland, a very different and quite harmless animal, as every Bushman knows.

From the absence of large rivers in Northern New Guinea, that part of the island is comparatively free from Crocodiles, but elsewhere they abound. Their power and voracity are well known to the Papuans, and have worked on the native mind to the usual effect,—the transformation of objects of fear into objects of reverence. Charms made of their teeth or bones are supposed by the wearers to protect them from the risk of being eaten by them. In Mowat, as we learn from Mr. E. Beardmore, "One of the disguises used during the North-West festivities is an imitation of a crocodile's head, placed over that of one of the performers ; to put it on at times other than those appointed is supposed to result in slow but sure death." The figure of the Crocodile appears among native carvings, but at present it is perhaps too much to say that these have always a religious significance.

The coasts of the island are also frequented by the marine Turtles of the Western Pacific, the Hawksbill, Loggerhead, and Green Turtle ; the last a near relative of the Atlantic source of turtle-soup, and, according to a local purveyor who does a large business in canoeing, yielding quite as good a product. The Hawksbill yields tortoise-shell of the best quality, but its use in the Papuan lands is very limited. From the Loggerhead oil is derived as an article of commerce by the inhabitants of Celebes, and the method of extraction might be beneficially communicated to the coast tribes of New Guinea. The value of the turtle-fishery to these people is indicated by many of their superstitious observances : "A man whose wife is pregnant must not spear turtle." "The bones of the back of the turtle are preserved during the breeding season." "When a brother spears his first turtle, marks are made on the body of the women." Such are the statements of the intelligent observer previously quoted.

In the fresh waters of New Guinea there are a few species of fluviatile Tortoises related to those of Australia, and, until lately, they might have been dismissed with an expression of wonder that, in spite of the swimming powers of the animals, no Asiatic form had passed the deep-sea boundary and penetrated into these island. But a discovery has been made in the Fly River of a very curious Chelonian, which in some respects appears to have descended from a foreign ancestry, as it presents features of the *Trionychidæ*, a Chelonian family.

of India, Africa, and America, but otherwise unknown in Australasia. A still more singular character seems to connect this new species with the marine Turtles. These latter swim, as is well known, by means of paddle-shaped limbs, which form most powerful organs of natation; the fresh-water Tortoises, on the other hand, have merely webbed feet with claws as swimming organs. *Carestochelys*, as the new reptile is named, is a fresh-water turtle, with the paddle-shaped feet of the oceanic turtles, but with claws on two of its toes, and, like the members of the *Trionychidæ*, is devoid of the horny plates which generally form the outer surface of the back of tortoises. It is the first in the course of our review to impress a stamp of originality upon the Papuan fauna. Apart from it, the tortoises of New Guinea and Australia have much more affinity with tropical American forms than with those of any other region.

We now approach the most numerous body of Papuan Reptiles, the Lizards; with a very few exceptions, harmless and useful animals, but to the generality unattractive. They are led, as in Australia, by a family of highest type, oldest pedigree, and greatest power among their kindred, the Varans or Monitors, grotesquely called in Bush parlance "guanas," from an idiotic identification of them with the iguanas of America. Remains recovered from post-tertiary deposits in Queensland have disclosed to Owen and others the former existence in Australia of Varans of crocodilian bulk, some of the bones indicating individuals twenty feet in length, and others of different species ranging downwards to ten feet. Their relics are in sufficient abundance to show that they must have been a dominant power among their contemporaries. Doubtless it was the work of ages that culminated in the development of gigantic forms like that of *Megalania prisca*, and possibly the process was inaugurated in other lands than Australia; but since we find them attaining their fullest maturity in the past, and preserving their numerical superiority in the present, in Australia and New Guinea, we are justified in assuming that these were their common fatherland. Six species inhabit New Guinea, and of these three are peculiar to it; ten species are found in Australia, of which six are unknown elsewhere, so that in the two there are nine species which are aboriginal, or just one-third of the whole number at present known. The islands of the Eastern Archipelago have six native species, India three, and Africa five. Comparing the areas of these habitats one with another, we see that the frequency of the species diminishes as the family recedes westward, a fact which strengthens the idea that its original centre of dispersion was in Australia, the scene of their heyday of power, whence they travelled, changing as they went, as far as the Cape of Good Hope. New Guinea, of course, they occupied as a primitive part of their domain; but New Guinea became cut off from it by the formation of Torres Straits, and then the evolution of its isolated Varans went on with fewer checks. The results achieved by it may, with some reserve, be taken as a measure of the time during which it has been in operation, and those results are somewhat scanty. Of the three Varans peculiar to New Guinea and its islands, one found in extreme isolation in the small island of Waigiou is but a slight modification of a species spread far and wide over Polynesia; another is barely distinguishable from a species common to

New Guinea and Torres Straits. One kind only, *Varanus salvadorii*, which is said to grow to a formidable size and to be an object of dread to the natives, presents well-marked features of its own. Even assuming that the Torres Straits species, *V. prasinus*, has not emigrated thence to New Guinea, but came into existence in that island, an assumption rendered unnecessary by the fact that two Australian Varans have by some means made their way across the water, we can find in New Guinea but two species essentially distinct from the rest. So far, then, as we can gather from the evidence of these lizards, the separation of New Guinea from Australia took place not very far back in the present geological period. But we must remember that the Varans are a declining race, and consequently less susceptible of modification than they once were.

Apart from the *Varanidae*, the Papuan species of the *Lacertilia* are about fifty in number. Of these, more than three-fifths are Scincs, those lizards which are completely protected by large and generally smooth overlapping scales, except on the head, which is shielded by separate scales disposed according to a definite plan. Five-sixths of these Scincs belong to a single tribe, the *Lygosomina*, so that this tribe is in New Guinea, even more than it is in Australia, the prevalent feature of the Lacertilian fauna. Its pre-eminence in variety of form is most conspicuous in its most developed genus, *Hinulia*, which has not only more species than any other genus, but has, with one exception, the whole of its species exclusively Papuan; whereas the next most numerous genus, *Emoa*, has a moiety of its species extra-Papuan also. Of the New Guinea Scincs as a whole, fully one-half are not recognised elsewhere. Two only have any claim to special mention, the plant-eating *Tiliqua*, formerly called *Cyclodus*, and familiarly the Sleeping Lizard or Blue Tongue, and, for some inscrutable reason, frequently supposed to be the dreaded Death Adder, and killed accordingly. The New Guinea species is somewhat different to any in Australia, and is stated to reappear in Java. In a vermiform lizard called *Dibamus* we have a much-degraded form of Scinc, a blind, limbless, underground reptile, which might be mistaken for a "blind worm." The inhabitants of many tropical lands are familiar with a little striped lizard which delights in running over walls and other surfaces exposed to the glaring sun in pursuit of flies. This is a naked-eyed Scinc, belonging to a group distinguished by the want of the ordinary movable eyelids, which are replaced by a transparent membrane. This widely-ranging little creature also inhabits New Guinea.

The Geckos of the island, unlike its Scincs, bring its fauna into contact with that of Australia through the medium of two species only; nor are the kinds peculiar to New Guinea many more in number. These little clicking, soft-skinned, and quaint-looking frequenters of country-houses are generally diffused through the warmer regions, and though they are in greater frequency in the Australian and Indian tropics than elsewhere, they are not especially concentrated anywhere as a rule. They may be known by their soft skin, the substitution of pimples for scales on the upper surface, their large eyes, fragile tails, and, in many cases, by an expansion of the under-surface of the toes, which enables them to climb the smoothest vertical surface with ease. It is an

amusing sight to watch a Gecko on one side of a window-pane pecking earnestly at a fly on the other side, evidently unconscious that it is acquiring Lacertilian wisdom at the expense of its appetite. The Geckos constitute about one-sixth of the Papuan lizards.

The *Agamidæ* form a third of the chief tribes of the Lizards ; it is a group for which there is no convenient name in the vernacular. Agamoid lizards are covered almost entirely with small overlapping scales, which are raised in the mid-line into a ridge or spine. Down the middle of the neck and back a row of scales is frequently enlarged in a fashion which converts them into a continuous crest. Next to the Varans, the Agamoids are the largest and most rapacious of lizards, a character not belied by their forbidding aspect. The startling Frilled Lizard of Australia, and the horrible-looking but perfectly harmless little creation afflicted with the name of Moloch, belong to the group. The Agamoids are in New Guinea exactly in the same proportions as the Geckos, if we may exclude two Australian species whose asserted presence in the northern island requires confirmation. Papuan Agamoids belong, with few exceptions, to one genus, *Goniocephalus*, and none of the species found in New Guinea, some seven or eight in number, occur elsewhere. In contrast with this great development of the genus in New Guinea, the single species inhabiting Australia stands out suggestively. It is met with in a single locality, in a region which is eminently Papuan in its conditions of temperature, rainfall, and luxuriant vegetation,—the habitat of the Cassowary, Tree-kangaroo, and the singular “Musk-rat.” This last is a descendant of an ancestral form found fossil in South Queensland, in company with an ancestor of the Crowned Pigeon of New Guinea. From these relations we are almost compelled to infer that, in and subsequent to the *Diprotodon* era in Australia, its limits embraced New Guinea. But *Goniocephalus* is an Indian as well as a Papuan genus, whence it seems more than probable that it spread from Asia eastwards during or soon after the expiration of the *Diprotodon* period, and in New Guinea developed under the congenial circumstances following its isolation, while in Australia it dwindled down to a single species, dependent for existence on a mere strip of coast-land. It is from such facts and inferences that we may deduce the notion of the twofold origin of the Papuan Reptiles.

The common Australian Snake-Lizard (*Lialis burtoni*), so well fitted to play the part of a snake for its own protection, is a denizen of New Guinea also, and of certain islands in Torres Straits. It is hardly necessary to credit it with power of self-transport from island to island ; its family is one of those that appear to be waning, and consequently it may have spread to its present limits before they were broken up by geological change.

Snakes.—There is a malignant charm in the word, compelling attention to these factitious foes of human-kind. Whatever interest other reptiles may have for us is mostly of an intellectual cast. Snakes appeal to the emotions, emblems of all that is vicious and perilous ; they excite in many minds nothing but feelings of repulsive horror. Fortunately, these are counteracted by another emotion, a natural curiosity, very wholesome in its results, to acquire informa-

tion about our enemies, tinged, perhaps, with sympathy with our fellow-men who are brought into close contact with them. Amongst these we may expect the natives of New Guinea to take a place. Yet in their case we may economise sympathy, for it is not a very hard one—less so, in fact, than that of the dweller in Australia, who seldom feels the presence of snakes a danger, seldom even thinks about them. It is not that there are fewer kinds of snakes in New Guinea than in Australia in proportion to its size, or that they are less prolific, but it is that a far larger proportion of them are as harmless as the absence of a poison apparatus can render them. Of twenty-eight species of Papua land and fresh-water snakes, only six, or perhaps seven, can be accounted dangerous, whereas the poisonous kinds form the great majority of Australian snakes. In Papuan snake-life the most prominent feature is the prevalence of Colubrine Constrictors, whose method of killing their victims by suffocation is so well known; they constitute nearly a third of the whole number of species, and, judging from their frequency in collections, we may fairly suppose their individual numbers to form almost a moiety of the snakes haunting any given locality. In the absence of a superabundance of small mammals, this unusual profusion of constricting snakes must be related to the multitude of birds, which convert the island into a resplendent aviary. The Constrictors of New Guinea are almost all Pythons; amongst them is the well-known Carpet Snake of Australia, no doubt attaining there the same great length of six or seven yards, as it is known to do in Queensland. Another family of Constrictors, the Boas, is represented by a single species, and between the Boas, with prehensile tails, and the Sand-Snakes without, a link has been found in the genus *Erebophis*, a second instance of Papuan originality carried to a notable degree. The rest of the innocuous snakes of the island belong to the same section of the Order; they are Colubrines adapted to the several spheres of their activity,—the trees, the ground, and the waters,—and, with one exception, all belong to genera known in Australia; the exception being the Indian genus *Brachyorrhos*, which has two species peculiar to New Guinea. The common aquatic snake *Tropidonotus picturatus*, which has in Australia so dangerous a mimic in the venomous *Tropidechis carinata*, is found in the Kei Islands and elsewhere. The ordinary Green Tree-Snake, in its normal form and in several varieties, and the Brown Tree-Snake, accompanied with two other members of its genus unknown elsewhere, are in New Guinea, and no doubt find themselves very much at home there amongst the throng of small birds which affords them sustenance. They are snakes whose long lithe bodies give them extraordinary powers of climbing, and, though sometimes rather ill-tempered in captivity, they are quite harmless and most graceful pets. A species of the terrestrial Colubrine family, the *Lycodontidæ*, occurs both in North Australia and New Guinea, but the genus in which it is placed, *Lielaphis*, is in the latter country enriched with two other species of local origin. Lastly, the Papuan coast swamps are visited by that curious *Coluber*, which looks as though it were striving to become a true Sea-Snake, *Chersydrus granulatus*, harmless in fact, though repellent in aspect. It is not generally known that this snake extends its range to Australia, but in the mangrove beds near Cairns on the Queensland coast it is not unknown.

The venomous snakes of New Guinea have, on the whole, a very familiar appearance to the eye of an Australian. There is a relative of one of the snakes he most dislikes, the common Black Snake ; there are three kinds of Whip Snake, a genus which includes the Brown Snake, perhaps the most deadly snake infesting Queensland, and there is a Death Adder, not to be distinguished, in spite of some slight modifications, from the Australian reptile. But, in addition to these, New Guinea is troubled by the presence of snakes which are the more obnoxious in that they habitually destroy the harmless kinds, replacing them with their own pernicious selves. These are the Ophiophagi or Snake-eaters, an Indian group, the Papuan species of which grow to a large size, and consequently indulge their cannibal propensities without stint. But though cannibalism is a fixed habit in these snakes, it is by no means confined to them ; on the contrary, it is probably the occasional practice of many of the venomous tribes endowed with power to secure the immediate death or collapse of their victims. The writer has been informed of an instance of it occurring under observation in a friend's garden in Australia.

The Blind Worms, which, in systematic arrangement, are placed at the head of the Ophidia or Snakes, have so little of general interest pertaining to them that they may be dismissed with the remark that two species of them have been described from the Kei Islands. Nor is it necessary to dwell upon the Sea-Snakes, so numerous in Australian seas, and of course frequenting the tidal waters of New Guinea in common with those of other coasts. Seven species of these dangerous animals have been collected around the island.

Omitting the Sea-Snakes, the genera of Papuan snakes are seventeen in number, and out of these, twelve, perhaps thirteen, are also Australian. The bare statement is the expression of a family likeness which strongly suggests community of origin in ages past. But, on the other hand, when we descend to the species, we find that fewer than a third of these are Australian as well as Papuan, and that these few include the Fresh-water and the Tree-Snakes, which have exceptional means of spreading from one land to another ; the Tree-Snakes especially, for they not only may be carried out to sea on floating trees, but they delight in swimming. There are, in fact, only about five species, of which we must suppose either that they have by some unknown means immigrated freely into New Guinea, or, deprived of that mode of maintaining their original form, have, nevertheless, resisted the transforming influence of insular circumstances. This influence has told effectually on the other species of the genera which are common to both countries, and also on some belonging to genera which occur in the Philippine and Malayan Archipelagoes, and has produced nine species which, as far as we know, are purely Papuan. The process of transformation has, therefore, been carried on for a considerable time, but has not endured long enough to effect more than specific changes, save in one instance. So that we are led by the testimony of the snakes to the same conclusion as that gathered from a review of the lizards, namely, that New Guinea was separated from Australia at no very modern period. We have seen that, both in the harmless and the venomous snakes, there has been an introduction of an Indian genus not known in Australia among genera all of which are shared by Australia. So far as it

goes, this confirms the other conclusion we reached, that the present reptiles of New Guinea were derived partly from the west, partly from the south.

From the Crocodile to the Blind Worm, those reptiles are, even now, full of interest when we look beneath the surface. How much more when their number has been fully ascertained by exploration, their life-histories deciphered on the spot, their organisation investigated, their pedigrees settled ! What enterprising young naturalist is ready to make New Guinea his laboratory, its natural history his monument ?

V.

USES OF SHELLS AMONG THE PAPUANS.

By C. HEDLEY, F.L.S.

SHELLS and shell-fish play an important rôle in the domestic life of New Guinea. For food, for ornaments, and for tools the Papuan, like his savage brethren in other lands, and like his prototype, our savage palæolithic European ancestor, finds the humble mollusk ready to his hand. As nations grow in civilisation they procure more dainty food than shell-fish; they replace their cones and cowries with gold and jewels, and reject the mussel-shell for a metal blade. In considering the mollusca as an article of food, we must remember that even among the most degraded races everything eatable is not eaten. As famine presses heavier upon a tribe, so are coarser and less agreeable foods used. During my travels in New Guinea I never saw any snails eaten; on the contrary, when I required a quantity to be boiled, one native damsel looked as disgusted as any English lady could have appeared. Sea-shells, however, contribute largely to the Papuan larder. Oysters and cuttlefish are here as popular dainties as they are in other parts of the world. The giant clam (*Tridacna gigas*) is usually part of the spoil when a canoe returns from fishing on the reefs. A stone breaks the front of the massive shell, and the animal, black-spotted with gold, is alone brought home. When nicely steamed in the native fashion, the *Tridacna* is not to be despised, as I can testify from experience; the great adductor muscle being the tit-bit. The lesser clams are also eaten, as *T. squamosa* and *Hippopus maculatus*. In a corner of a native house I once saw a pile of the empty shells of *Batissa violacea*; no doubt the occupants had lately furnished a meal to the natives. All the commoner Strombidæ I believe to be eaten. The beach before the village at Port Moresby is paved with brilliant crimson and black fragments of *S. luhuanus*, and I noticed quantities of *S. floridus*, *dentatus*, and *gibberulus*, in the fishing-baskets of the D'Entrecasteaux people. Such an uninviting morsel as *Peronia tongana* is not overlooked by the Port Moresby folk in hard times. Both in Milne Bay and in Port Moresby the Neritæ, *N. undata*, *maxima*, *plicata*, and *albicilla*, *Purpura pica*, and *Turbo sparverius* are consumed as food.

The natives are quite aware of the poisonous bite inflicted by several of the Cones. While collecting on a coral reef, I once rolled over a boulder and exposed to view a living *Conus textile*. Before I could pick it up, one of my coloured companions hastily snatched it away, and pointing to its "business-end," explained with vivid gesticulations its hurtful qualities. He would on no account allow me to handle the shell, but insisted on putting it himself into my bottle of spirits. *Conus millepunctatus* is everywhere eagerly sought. The anterior half and the spire are ground away, and the bracelet thus formed is worn on the biceps of

the arm. Small shells are made into bracelets for children, and when the child's growth causes the ring to become painfully tight, it is broken with a stone. The spire of *C. millepunctatus* is often ground into a flat disc, and worn on the chest or back, suspended from a necklace. Sometimes these pendants are in a series of three or four, each larger than the one below.

The crimson outer lip of *Strombus luhuanus* is a favourite material for necklaces. It is cut into flat squarish beads of about $\frac{1}{2}$ inch in diameter, perforated by a stone drill and strung on fibre. Worn as a fillet round the forehead at Port Moresby were a row of small cowries. The spire being always ground away, I could not with certainty identify the species, but believed it to be *C. annulus*. The cowries most admired in New Guinea are the white ones of the genus *Ovula*. The inhabitants of Milne Bay indifferently applied the term "dunala" to *O. ovum*, *O. verrucosa*, and *O. tortilis*. The larger species, *O. ovum*, was exclusively used for ornamenting the canoes whose carved stems and sterns were wreathed with festoons of this shell; while the smaller kinds were reserved for their personal adornment. The Milne Bay natives valued these latter highly, using them as armlets. One I purchased of *O. tortilis* contained twenty-one shells pierced at each end, and strung upon double threads of fibre. In the D'Entrecasteaux Group I observed a native wearing a belt of these shells. Upon the St. Joseph River the village elders were usually distinguished by a single *O. verrucosa* worn on the centre of the forehead. Another ornament most prized and reluctantly sold is the nose-piece—itoto—of the Milne Bay people. Inferior ones are constructed of bone, but the genuine article is ground down from the thickened, reflected, outer lip of *Cassia cornuta*. The specimens I obtained were $4\frac{1}{4}$ inches long, and $\frac{1}{4}$ inch in diameter at the centre, whence they tapered gradually to the sharply pointed extremities. The convex sides were bright-orange, the concave white. The shape approached a crescent as nearly as the material would permit. They are worn in a hole through the septum of the nose, the points curving up towards the eyes. *Trochus niloticus* shells are manufactured into armlets by breaking away the rest of the shell from the periphery of the last whorl, which is then ground smooth. These by the Milne Bay natives are called Kakati, and are esteemed of small value. Sir William MacGregor records that the inhabitants of the banks of the Fly wear a large plate cut from *Melo diadema*, which he styles the public shell. The pearl-shell, *Meleagrina margaritifera*, is abundant round the coasts of New Guinea, and is much used for ornament among the natives. Each valve is cut into as large a crescent as possible and slung across the chest. A shell called Kaïma was accounted so great a treasure that no price would buy it. I observed it commonly worn from Port Moresby to South Cape. The largest fragment I saw was about three inches across. The colour was scarlet without and white within. The hinge being invariably ground smooth, also the outer surface, it was impossible to determine the species, which I conjecture to belong to the genus *Spondylus*. The owners describe the mollusk as being only obtained by diving in deep water, where it grows on the surface of stones. It is very desirable that perfect specimens be sent for determination to a scientific centre. The Kaïma is worn suspended from the ears, and little locks of hair are twisted up and thrust through a hole in the centre of the frag-

ment of shell till a line of these hang over the forehead. This apparel is very *chic*. All these ornaments are bequeathed from father to son, and more valued in the interior than on the coast. No individual dons his finest costume habitually; that he reserves for dances and gala-days. For trumpets the Papuans of Eastern New Guinea utilise the shells of *Triton tritonis*, *Ranella lampas*, and *Cassis cornuta*. A hole drilled in one of the upper whorls serves as mouthpiece. When a pig is killed and a feast given the trumpet-shells are in great requisition. While sailing along an unfrequented coast, which is still represented in most maps by a vague dotted outline, we continually heard, though half a mile from the shore, the low booming of the conch-shell echoing from hill and vale. From village to village the news—a ship! a ship!—was being signalled.

From a D'Entrecasteaux man I purchased a shell utensil manufactured from *Cassis cornuta*. One of the largest peripheral nodules had been cut out from the shell so as to form a small cup. This was used by toothless old men who could no longer chew the betel-nut for pounding it into paste. Another betel-nut mortar from Normanby Island was beautifully carved from *Tridacna gigas*.

Steel is rapidly replacing shell for knives. I noticed that on the St. Joseph River the pouch for carrying the betel-chewing requisites generally held a *Batissa* valve, used for paring the pepper stems into convenient morsels. At the same place the women used the *Unio* shell for peeling yams. I obtained a *Mytilus* valve from a Fergusson Islander who had just been using it as a knife. Exquisite little oval spoons (*kahi*) are made in the East End from pearl-shell. They are cut from both the black-edged *Meleagrina cumingi* and the golden-edged *M. margaritifera*, and are about 3 inches long and 2 broad, often with the edge cut into serrations. For eating the hard white part of a cocoa-nut they are very convenient, and are used at meal-times. In Milne Bay I bought a spoon or scoop cut from the periphery of the last whorl of *Turbo sarmaticus*. It was polished to show the nacre, and measured $7\frac{1}{4}$ inches long, 1 inch deep, and 3 inches wide. All along the southern coast *Melo diadema* is used as a baler in the canoes, the ventral side of the last whorl being broken so that the inserted hand may grasp the *Columella*.

VI. NEW GUINEA DIALECTS.

Note.—In order to confine the account of New Guinea dialects within the limits of an appendix, it has only been possible to make a selection of the principal words from the exhaustive vocabularies compiled by Sir William MacGregor and others.

VOCABULARY OF THE KIWAI LANGUAGE, BRITISH NEW GUINEA.¹

SYSTEM OF ORTHOGRAPHY FOR NATIVE NAMES OF PLACES (ADOPTED BY
H.M.'S LORDS OF THE ADMIRALTY AND THE ROYAL GEOGRAPHICAL
SOCIETY, AND FOLLOWED IN THIS VOCABULARY).

Rules.

1. The true sound of the word as locally pronounced will be taken as the basis of the spelling.

2. An approximation, however, to the sound is alone aimed at. A system which would attempt to represent the more delicate inflections of sound and accent would be so complicated as only to defeat itself. Those who desire a more accurate pronunciation of the written name must learn it on the spot by a study of the local accent and peculiarities.

3. The broad features of the system are that vowels are pronounced as in Italian and consonants as in English.

4. One accent only is used, the acute, to denote the syllable on which stress is laid. This is very important, as the sounds of many names are entirely altered by the misplacement of this stress.

5. Every letter is pronounced. When two vowels come together, each one is sounded, though the result, when spoken quickly, is sometimes scarcely to be distinguished from a single sound, as in *ai*, *au*, *ei*.

The amplification of the rules is given below :—

Letters.	Pronunciation and Remarks.	Examples.
a	<i>ah</i> , <i>a</i> as in <i>father</i>	Java, Banána, Somáli, Bari.
e	<i>eh</i> , <i>e</i> as in <i>benefit</i>	Tel-el-Kebír, Oléleh, Yezo, Medina, Levúka, Peru.
i	English <i>e</i> ; <i>i</i> as in <i>ravine</i> ; the sound of <i>ee</i> in <i>beet</i> . Thus, not <i>Feejee</i> , but	Fiji, Hindi.
o	<i>o</i> as in <i>mote</i>	Tokio.
u	long <i>u</i> as in <i>flute</i> ; the sound of <i>oo</i> in <i>boot</i> . Thus, not <i>Zooloo</i> , but	Zulu, Sumatra.
	All vowels are shortened in sound by doubling the following consonant.	Yarra, Tanna, Mecca, Jidda, Bonny.
	Doubling of a vowel is only necessary where there is a distinct repetition of the single sound.	Nuuluúa, Oosima.

¹ Compiled by Sir William MacGregor, K.C.M.G., M.D., &c.

Letters.	Pronunciation and Remarks.	Examples.
ai	English <i>i</i> as in <i>ice</i>	Shanghai.
au	<i>ow</i> as in <i>how</i> Thus, not <i>Foochow</i> but	Fuchau.
ao	is slightly different from above	Macao.
ei	is the sound of the two Italian vowels, but is frequently slurred over, when it is scarcely to be distinguished from <i>ey</i> in the English <i>they</i> .	Beirút, Beilúl.
b	English <i>b</i> .	
c	is always soft, but is so nearly the sound of <i>s</i> that it should be seldom used. If <i>Celebes</i> were not already recognised it would be written <i>Selebes</i> .	Celebes.
ch	is always soft as in <i>church</i>	Chingchin.
d	English <i>d</i> .	
f	English <i>f</i> ; <i>ph</i> should not be used for the sound of <i>f</i> . Thus, not <i>Haiphong</i> , but	Haifong, Nafa.
g	is always hard. (Soft <i>g</i> is given by <i>j</i> .)	Galápagos.
h	is always pronounced when inserted.	
j	English <i>j</i> . <i>Dj</i> should never be put for this sound.	Japan, Jinchuen.
k	English <i>k</i> . It should always be put for the hard <i>c</i> . Thus, not <i>Corea</i> , but	Korea.
kh	The Oriental guttural	Khan.
gh	is another guttural, as in the Turkish	Dagh, Ghazi.
l	} As in English.	
m		
n		
ng	has two separate sounds, the one hard as in the English word <i>finger</i> , the other as in <i>singer</i> . As these two sounds are rarely employed in the same locality, no attempt is made to distinguish between them.	
p	As in English.	
q	should never be employed; <i>qu</i> is given as <i>kw</i> .	Kwangtung.
r	} As in English.	
s		
t		
v		
w		Sawákin.
y	is always a consonant, as in <i>yard</i> , and therefore should never be used as a terminal, <i>i</i> or <i>e</i> being substituted. Thus, not <i>Mikindány</i> , but not <i>Kwaly</i> , but	Kikuyu.
z	English <i>z</i> Accents should not generally be used, but where there is a very decided emphatic syllable or stress, which affects the sound of the word, it should be marked by an <i>acute</i> accent.	Mikindáni. Kwale. Zulu. Tongatábu, Galápagos, Paláwan, Saráwak.

NOTE.—In this language the adjective always precedes the noun. A plural is sometimes formed by adding *ró* to the singular. The inflection of verbs is apparently complicated and is not mastered herein. When no accent is marked it is on the penultimate, its most common place; but to this there are many exceptions

in this language. The vocabulary has been chiefly drawn up at the village usually called "Kiwai," but named by its own people I'āsa. With dialectic differences this language is spoken, or understood, all over the island of Kiwai, and round the coast as far as the Mai Kussa, and for eighty or a hundred miles up the Fly River. Kubira and Doropodai use a different language, but many members of those tribes have a knowledge of the Kiwai tongue. The Sumai people speak very indistinctly, as if the tongue were folded, and they slur over the words so as to produce many contractions that puzzle the ear at first.—W. M.

TABLE SHOWING CERTAIN PRINCIPAL WORDS, &c., USED BY ABORIGINALS OF
KIWAI, IPISIA, SAGUANA, SAMARI, MABUDAMU, AUTI, WIORUBI, AND
SUMAI VILLAGES, BRITISH NEW GUINEA.

One— <i>Nao</i> .	Day— <i>Sai</i> .
Two— <i>Netéwa</i> .	Death— <i>Upára</i> .
Three— <i>Nétewa nāo</i> .	Devil— <i>Mānākai</i> .
Four— <i>Netewa netewa</i> .	Dog— <i>Sio</i> .
Five— <i>Netewa netewa nao</i> .	Drink— <i>Obo odio</i> ; out of hand, <i>tuto odio</i> .
Six— <i>Netewa netewa netewa</i> .	East— <i>Dibiri duba</i> .
Seven— <i>Netewa netewa netewa nao</i> .	Eat— <i>I'riso, odio</i> .
Eight— <i>Netewa netewa netewa netewa</i> .	Egg— <i>Iópu</i> ; turtles' eggs, <i>gamo iópu</i> ;
Nine— <i>Netewa netewa netewa netewa nao</i> .	birds' eggs, <i>wowogo iópu</i> .
Ten— <i>Modoboima</i> .	Enemy— <i>Irisai wáda</i> .
Eleven— <i>Modoboima nao</i> .	Evening— <i>Adímo, erasugumai</i> .
Twelve— <i>Modoboima netewa, &c., &c.</i>	Father— <i>Abera, Baba</i> .
	Feast— <i>Samo</i> .
Anger— <i>Woroworo</i> .	Fire— <i>Era</i> .
Arrow— <i>Tere</i> .	Food— <i>Iršo, topo</i> .
Ask— <i>Arogo</i> .	Girl— <i>Busēre</i> .
Axe— <i>Kabi</i> ; stone axe, <i>warikabi, daun-</i>	God— <i>Oradubu, aramo rubi</i> .
<i>omu, emaiiipu</i> .	Good— <i>Wade, geso</i> .
Baby— <i>Osiomere, osiobesere</i> .	Guest— <i>Apero rubi</i> .
Bad— <i>Karakarai, uba, gamsa</i> .	Gun— <i>Pāñoro, or pāñoro gagāri</i> .
Boat— <i>Pe</i> ; whaleboat, <i>eke eke pe</i> .	Hair— <i>Muso</i> .
Boy— <i>Mere</i> .	Hand— <i>Tuigiri</i> .
Brother (elder)— <i>Namu</i> .	Hawk— <i>Waríu, &c.</i>
Brother (younger)— <i>Niragerema</i> .	Head— <i>Epūru</i> ; hair of, <i>epūru múso</i> .
Canoe— <i>Pe</i> ; the outrigger, <i>sarima</i> ; cross-	Heart— <i>Tusuópu, otakapúki</i> .
beams from canoe to outrigger, <i>piu</i> ;	Heavens— <i>Osúa</i> .
sticks fastening piu to sarima, <i>tugu</i> ;	Hell— <i>Sopuanotoi</i> .
deck, <i>pátara</i> ; hold, <i>urouro</i> .	House— <i>Moto</i> ; house-posts, <i>abo</i> ; house-
Chief— <i>Buaraigo</i> ("Mamoosi," intro-	fly, <i>susuome</i> .
duced).	Husband (spouse)— <i>Uramu</i> .
Comb— <i>Ipōgi</i> .	Idiot— <i>Sobu</i> (mere).
Cry (weep)— <i>Idobi, or idopi, of children</i> .	Ill— <i>Teme teme</i> .
Dance— <i>Madio</i> .	Island— <i>Māmōkō</i> .

- Jaw, lower—*Tatamu*.
 Jump—*Irobouai*.
 Kill—*Opia* ; of mosquito, *dōūā*.
 Kiss—*Osomia*.
 Knife—*Giri*.
 Land—*Dodo*.
 Language—*Auera*.
 Lie (speak untruths)—*Mabuauera*.
 Life—*Kigiro*.
 Light (a.)—*Toru toru*.
 Lip—Upper, *ipūsu* ; lower, *ipusuata*.
 Little—*Ekebūri*, *eke*.
 Man—*Dubu*.
 Moon—*Sagana*.
 Morning—*Duduaere*.
 Mouth—*Magatasia*.
 Name (s.)—*Paina*.
 Night—*Hanuaboi*.
 Noon—*Sai épi*.
 North or North-west—*Suróma*.
 Nose—*Wōdi*.
 Oar—*Aibi*.
 Ocean—*O'romo damo*.
 Old—*Tagára*.
 Paddle (s.)—*Aibi* ; (v.) *abidiro*.
 Path—*Gābo*.
 Peace—*Miro*.
 Pig—*Baroma*.
 Pot (saucepan)—*Wedere*.
 Present (gift)—*Nirimagari*.
 Rain—*Mobūro* ; heavy thunder-shower,
 River—*Goua*, *oromo*. [árumo.
 Rob (v.)—*Imadi*.
 Root—*Miti* ; tree root, *ota miti*.
 Sail—*Sawatíro* or *tiro* ; take down, *tiro*
oraráo ; put up sail, *tiro osúa*.
 Salt—*Karakara*.
 Sea—*Uro*.
 Sister (man's)—*Korodirāi*, elder ;
mabā, younger.
 Son—*Mere*.
 Soul—*Urio*, *mánakai*.
 South—*Sie rarogóro*.
 South-east—*Susu rarugóro*.
 South-west—*Sĩa*.
 Star—*Gugi*.
 Steal—*Piro*.
 Stone axe—*Emoiópu*.
 Story (tale)—*Totóma*.
 Sun—*Sai*.
 Tail—*Nupu*.
 Tobacco—*Sūkūbá*.
 To-morrow—*Dudūōsai*.
 To-night—*Abraduo*.
 Treaty—*Paudo*.
 Tree—*Ota*.
 True—*Nani*.
 Twilight—*Sawasawa*.
 Uncle—*Nogereburo*.
 Upper arm—*Tupi*.
 Us, to us—*Gido* or *nimogido*.
 Venomous—*Uparu*, *dirioro*.
 Village—*Maura*.
 War (s.)—*Boso*.
 Warrior—*Boso didiri*.
 Waterhole—*Bobo*.
 Wealth or property—*Borguborgu siria*.
 West—*Irārasukumai*, *sie*.
 Whitemen—*Keakea dubu*.
 Wind—*Susua*.
 Woman—*Upi*.
 World—*Tawa tawa tutūru*.
 Yam—*Umamu*.
 Year—*Urato*.
 Yes—*Iō*.
 Yesterday—*Duduáta* or *duduatāsū*.
 I—*Mōū*.
 Thou—*Rōū*.
 He or she—*Nōū*.
 We—*Nimo*.
 We two—*Nimoto*.
 We three—*Nimoibi*.
 We all—*Nimosirio*.
 You—*Nigo*.
 You two—*Nigoto*.
 You three—*Nigoibi*.
 You all—*Nigosirio*.
 They—*Nēi*.
 My—*Moro*.
 Thy—*Roro*.
 His—*Nou*.
 Ours—*Nimo*.
 Yours—*Nigo*.
 Theirs—*Nei*.

LIST OF THE VILLAGES WITH WHICH KIWAI (I'ASA) MEN CLAIM THE RIGHT
TO INTERMARRY, AND TO WHICH THEREFORE THEY CAN INTRODUCE
TRAVELLERS, &c. (56.)

This List is probably not trustworthy.

Ipisia.	Saibodai.	Káramakarama.
Saguana.	Dawanidai.	Besamo.
Samari.	Aitarubi.	Adurodai.
Mabudamu.	Baibadai.	Bigomidai.
Sumai.	Tudorubi.	Badaraigo.
Kabira.	Moriamo.	Tugere.
Auti.	Augaro.	Uruma.
Doropodai.	Mabiago.	Koabaruba.
Demaratamarubi.	Moaraigo.	Epidarimarubi.
Dorpotamarubi.	Buserebusere.	Nabiedai.
Agobaiotamarubi.	Dibidarimo.	Tiridarimo.
Wadadarubitarubi.	Sisiamido.	Baramodarimo.
Dawaredarima.	Sauridarimo.	Dagadarimo.
Ubidarima.	Wañisi.	Bunagirubi.
Gibalarubi.	Nakidarimo.	Binarubi.
Burai.	Gemidai.	Oropairubi.
Dararubi.	Purutururubi.	Unadarimo.
Turaturarubi.	Gonaburarubi.	Maipani.
Kadowarubi.	Gereba.	

LIST OF DIFFERENT KINDS OF BANANAS CULTIVATED BY THE KIWAI (I'ASA)
PEOPLE. (36.)

Sosido.	Koikumo.	Aribamo.
Berego.	Sime.	Made.
Aumaro.	Iribu.	Dudu.
Sobomaro.	Kaiani.	Mauku.
Soke.	Koidumo.	Isisaia.
Giromi.	Keneobira.	Waboda.
Boia.	Ibubu.	Koikumo.
Bubuama.	Sigubia.	Bubugiro.
Oboronepe.	Boromo.	Baranedó.
Oriomu.	Gobodo.	Sibara.
Mabumaro.	Uruma.	Kokuri.
Awadau.	Kumo.	Auomaro.

The first eight on the list are generally considered the best, and some of them will be found to be really excellent.

LIST OF DIFFERENT KINDS OF YAMS PLANTED BY THE PEOPLE OF KIWAI
(I'ASA). (20.)

Buruma.	Odomuto.	Masea.
Kodoruti keakea.	Barako.	Minoko.
Erawo.	Userio.	Boa.
I'rao.	Piuri.	Megemege.
Momoro.	Budano.	Karao.
Kawi.	Sene.	Muto.
Kodoruti dogodogo.	Pato.	

The three first on the list are generally considered to be the best, but some of the others are very good.

LIST OF DIFFERENT KINDS OF SWEET POTATOES CULTIVATED BY THE PEOPLE
OF KIWAI (I'ASA). (10.)

Keakea.	Keakeaásumo.	Gamosusu.
Dogodogoásumo.	Diridiri.	Parako.
Peredara.	Kobodo.	Bagoro.
Asumo.		

The two first are perhaps the best.

LIST OF FIBRES USED AT KIWAI (I'ASA), SOME OF WHICH WILL BE OF
COMMERCIAL VALUE. (11.)

Midiri sirigo ; from Midiri shrub.	Toma sirigo ; from bread-fruit.
Taga sirigo ; from pandanus root.	Idi sirigo ; perhaps a kind of Taga sirigo.
Sime sirigo ; from banana stem.	Oi mosore sirigo ; from cocoanut husk
Sosome sirigo ; from Vau, hibiscus.	Turio sirigo ; from a creeper, Turio.
Guri sirigo ; from Guri shrub.	Keanenese sirigo.
Pou sirigo ; from palm leaf.	

LIST OF SNAKES KNOWN BY THE NATIVES TO EXIST ON KIWAI ISLAND. (19.)

Sagarunepe ; probably a lizard re- sembling a snake.	Warea ; said to be poisonous.
Sorea ; said not to bite.	Era ; said to be poisonous.
Sopunii ; said not to bite.	Kiso ede ; said to be poisonous.
*Iare ; said not to bite.	Diri oro ; said to be poisonous.
*Esee ; said not to bite.	*Rupi ; said to be poisonous.
*Momo ; said not to bite.	Erawabu ; said to be poisonous.
*Waruku ; said not to bite.	*Uba ; said to be poisonous.
*Poro ; said to be very fierce.	*Ubaru ; said to be poisonous.
*Megedubu ; much dreaded.	Amawitu ; said to be poisonous.
	Topo ; said to be poisonous.

Those with * are eaten.

LIST OF VILLAGES AND THEIR CHIEFS ON KIWAI ISLAND.
(11 Villages ; 13 Chiefs.)

Village.	Chief.	Village.	Chief.
Saguana	Sagigi.	Imari or	{ Koresa.
Samari	Gariamü.	Sumai	{ Atai.
Mabudamu	Kamiru.	Auti	. Dugi.
Kiwai or	{ Daida.	Doropodai	. Nopio.
I'asa	{ Kanani.	Wiorubi	. Búruma.
Kubira	Gamodo.	Agabara } Ipihia	{ Buni.
		Gamobobo }	{ Abi.

VOCABULARY OF THE LANGUAGE SPOKEN AT SAIBAI,
DAUAN, AND BOIGU, AND UNDERSTOOD ON THE
ADJACENT COAST OF BRITISH NEW GUINEA.¹

NOTE.—Final *ö* in this language is so short that it is often not distinctly heard ; it seems to be more clearly expressed at Boigu than at Saibai.

The list has been prepared from natives of Boigu, Dauan, and Saibai. This language is probably not that ordinarily spoken by any of the adjacent New Guinea tribes, but it is more or less understood by several of them.

TABLE SHOWING CERTAIN PRINCIPAL WORDS, &c., USED BY ABORIGINALS OF
THE ISLANDS OF BOIGU, DAUAN, AND SAIBAI, AND UNDERSTOOD ON THE
COAST OF BRITISH NEW GUINEA NEAR THOSE ISLANDS.

One— <i>Urápon</i> .	Bury— <i>Maramataiánö</i> .
Two— <i>Ukasára</i> .	Buy— <i>Barbudan</i> , or <i>japudamínö</i> .
Three— <i>Ukamondobigal</i> .	Canoe— <i>Gúlö</i> .
Four— <i>Ukauka</i> .	Chief— <i>Kuikúligna</i> .
Five— <i>Ukaukamodobai</i> .	Child— <i>Maginakázi</i> .
[Have no further numbers.]	Cloth— <i>Dumawaru</i> .
	Cocoanut—with water and no kernel, <i>mutälö</i> ; for drinking purposes, <i>bari-</i> <i>bara</i> or <i>urábö</i> ; old dry nut, <i>gi</i> .
Adze— <i>Wálgan</i> .	Cord (rope)— <i>Wali</i> .
Afternoon— <i>Kutápa</i> .	Cousin— <i>Tukuiapu</i> .
Anger— <i>Maitaiginga</i> .	Cover— <i>Súpö</i> .
Arrow— <i>Taiak</i> .	Dance— <i>Girer</i> .
Baby— <i>Kazi</i> , <i>mapétö</i> .	Dark— <i>Kubil</i> .
Bad— <i>Wati</i> .	Day— <i>Göiga</i> .
Breath— <i>Gnaná</i> .	Dead and Death— <i>Umánga</i> .
Brother (woman's)— <i>Gnaubátö</i> .	Deceit— <i>Ngalakípa</i> .
Brother (man's elder)— <i>Kuikuiga</i> .	
Brother (man's younger)— <i>Kutaiga</i> .	

¹ Compiled by Sir William MacGregor, K.C.M.G., M.D., &c.

- Demon—*Markai*.
 Drink—*Wanin*.
 East—*Palágís*.
 Eat—*Ai pourtánö*.
 Enemy—*Rídu*.
 Evening—*Kütäpa*.
 Family—*Máitaláigä*.
 Famine—*Aiginga*.
 Father—*Babö* or *tati*; child says *baba*,
 grown sons say *tati*.
 Fear—*Aka*.
 Feast—*Ta*.
 Fire—*Möi*.
 Fish—*Wapi*.
 Forenoon—*Dadogöiga*.
 Friend—*Tökuiapö*.
 Ghost—*Mari*.
 Girl—*Gnawakazi*.
 God—*Augada*.
 Good—*Kapu*.
 Great—*Kaiza*.
 Gun—*Gagai*.
 Hand—*Getö*.
 Head—*Kuíkò*.
 Heart—*Nganakápö*.
 Hell—*Apálo*.
 House—*Lágö*.
 Hunger—*Mitaiginga*.
 Husband (spouse)—*Imi*.
 Ill—*Kikiri*.
 Inland—*Matadödálö*.
 Island—*Kawa*.
 Jaw (lower)—*Bágö*.
 Joint—*Tidaimipa*, *wiámö*.
 Kill—*Mātaman*.
 Kiss—*Gudutapaman*.
 Knee—*Kulu*.
 Knife—*Gítúrika*; small knife, *Gi*.
 Laugh—*Gi*.
 Life—*Igililgna*.
 Light (s.)—*Boia*.
 Language — *Ya* (*saibai ya*, *Saibai*
 language).
 Little—*Magína*.
 Man—*Mabaigö*; plural *mabaigalö*.
 Mat—*Waku*.
 Medicine—*Gaugu*.
 Midday—*Dadagaiga*.
 Moon—*Mölpälö*.
 Mountain—*Pádö*.
 Murder—*Gamuia mataman*.
 Name (s.)—*Nelö*.
 Night—*Kubilö*.
 No—*Lüunga* (stronger); *maigi* (com-
 mon word).
 Noon—*Dadagaiga*.
 North—*Naigai*.
 Oar—*Kaba*.
 Old—*Möroigö*, of man; *kulba*, of house.
 Path—*Yabugúdö*.
 Peace—*Paudö*.
 Pearl-shell—*Müi*.
 Pig—*Burúmö*.
 Plenty—*Kaigursáro*.
 Pot—*Plagúsi*; iron, *turik plagusi*.
 Rain—*Ari*.
 Ringworm—*Kamikámö*.
 River—*Kussa*.
 Sail—*Waku*.
 Salt—*A'lötö*.
 Sea—*Bäu*.
 Ship—*Kaigúlö*.
 Sister—*Babátö*, if she has no children;
 wamulaigö, if she has children.
 Sleep—*Utoi*.
 Snake—*Tabu*; poisonous snake, *umal*
 tabu; innocuous snake, *kasa tabu*.
 Soul—*Mari*.
 South—*Je*.
 Speech—*Maumisínö*.
 Stone axe—*Goba*.
 Story (tale)—*Adi*.
 Sun—*Güiga*.
 To-day—*Kaiba*.
 To-morrow—*Bánga*.
 Tree—*Kaipui*; house-post, *kúrrugut*.
 True—*Mina*.
 Uncle—*Igalaigu*.
 Village—*Múdö*; big house, *Kailagö*;
 small house, *maginalagö*.
 Venomous—*Umal*.
 War (s.)—*Lakadánö*.

Warrior—*Murawardan*.
 Water (fresh)—*Gnuki*.
 Wealth or property—*Japulaika*.
 West—*Gaiga pūdiso*.
 White men—*Markai* (devils or white men).
 Wife (spouse)—*Ipi*.
 World—*Imána*.
 Yam—*Gabau*.
 Yes—*Wa*.
 Yesterday—*Wargàiga*.
 I—*Gnai*.
 Thou—*Gni* or *gnido*.
 He or she—*Gnoi*.

We—*Gnabangaba* (inclusive, we two).
 We three—*Gnalpagnalpa*.
 All we (of more than three)—*Gnapamura*.
 You two—*Gnipel*.
 You three—*Gnitagnita*.
 All you (of many)—*Gnitamura*.
 They—*Tanu*.
 My—*Gnau*; my hat, *gnau walápa*.
 Thy—*Gninu*; thy hat, *gninu walápa*.
 His—*Gnungu*; his hat, *gnungu walápa*.
 Ours—*Gnabanu*; our (two) hat, *gnabanu walápa*.
 Yours—*Gnalpan*; our (three) hat, *gnalpan walápa*.

VOCABULARY OF THE UPPER ST. JOSEPH DISTRICT DIALECT.

One—*Angaong amo, aungao*.
 Two—*Aungi*.
 Three—*Oio*.
 Four—*Pangi*.
 Five—*Ima'a*, or *aufaaiufufu*.
 Six—*Ngéa, nga*.

(I suspect the first word in "one" is same as six.)

Seven—*Ngéa aungi, ngaunga*.
 Eight—*Ngéa oio, nga oio*.
 Nine—*Ngéa pangi*.
 Ten—*Oua*.
 Eleven—*Oua, angao*.
 Twelve—*Oua aungi*.
 Twenty—*Oua oua*.
 &c. &c.

The most intelligent natives seem to seldom count beyond five, at which they get into difficulties, but reach ten by construction, &c.

Adze—*Panganga*.
 Afternoon—*Gina engabi*.
 Anger—*Nuamai egubu*.
 Arrow—*Nungu*.
 Axe—*Inaina*.
 Baby—*Imoi angua*.

Bad—*Apala*.
 Beautiful—*Favinga bauma*.
 Big—*Akaigia*.
 Body—*Fanga*.
 Boy—*Imoi*.
 Brother (woman's)—*Afakua*; (man's elder) *anga*; (man's younger) *akina*.
 Buy—*Ava ava*.
 Canoe—*Naanga*.
 Chief—*Lopiakaikia*.
 Child—*Naunga*.
 Cloth—*Ipi, kiapu*; bread-fruit cloth *ongoibinu*.
 Comb—*Ikuakua*.
 Daughter—*Iviau*.
 Day—*Kina*.
 Dead, death, and die—*Ema'i*.
 Double—*Epauapua*.
 Dream—*Langipi*.
 Drink—*Moinu*.
 Earth—*Ngua*.
 East—*Kaengakaina*.
 Enemy—*Kiōū*.
 Evening—*Napinapi*.
 Face—*Vainau*.

- Falsehood—*Lohiapara, lohon geiau.*
 Farewell—*Mafe'u.*
 Fear—*Emangi'i, maliki.*
 Feast—*Movake.*
 Fire—*Lō.*
 Fish—*Ma'a.*
 Food—*Foama.*
 Friend—*Eua'u.*
 Girl—*Iviau.*
 God—*Aungi.*
 Good—*Faungina.*
 Gun—*Ngungu.*
 Hand—*Imau afe, ima'a.*
 Head—*Kangia.*
 Heart—*Waboba* (name given to one shown to natives at Ngauauni).
 Heat—*Eiabu.*
 House—*E'a.*
 Hunger—*Nauekimo.*
 Husband—*Akava.*
 Ill—*Eiava.*
 Inland—*Angumā.*
 Island—*Kerebua.*
 Jaw—*Akea.*
 Joint—*Emuamunga.*
 Kill—*Keaunia ema'i.*
 Kiss—*Engoapia.*
 Knife—*Aiva.*
 Left side—*Elavangi.*
 Life—*Eangūē.*
 Little—*E'elengamo.*
 Load (s.)—*Obuau (?)*.
 Mamma—*U'u.*
 Man—*Au.*
 Marry—*Eakava.*
 Midday—*Kina ufua.*
 Moon—*Ngava* or *ngava huna.*
 Mountain—*O'oiंगा.*
 Murder—*Eaubainonga.*
 Name—*Aka.*
 Night—*Anguenapi.*
 No—*La'i.*
 Noon—*Kinaufua.*
 North—*Alo kaina.*
 Old—*Uaina.*
 Path—*Keanga.*
 Peace—*Nangau.*
 Present (gift)—*Nafenafeauna.*
 Rain—*Imu.*
 Ringworm (scaly)—*Elari*; (not scaly) *pai fange eibuibu.*
 River—*Ake.*
 Rob—*Māinio.*
 Sail—*Raea.*
 Sea—*A'u.*
 Ship—*Akaikia.*
 Sister (man's)—*Afakua.*
 Soul—*Aungi.*
 South—*Kipokaina.*
 South-east—*Ameku.*
 Sun—*Kina.*
 Tobacco—*Kiare* (native-grown), *kuku, kamake.*
 To-day—*Pau.*
 To-morrow—*Vafoko.*
 Tree—*Au.*
 True—*Efuamo.*
 Uncle—*Amaeke.*
 Village—*Pangua.*
 War—*Eaungia.*
 Warrior—*Au auaunga.*
 Water—*Vei.*
 Wealth or property—*Eaparai'ai.*
 West—*Kibo kaina.*
 White men—*Fangakelonga.*
 Wife—*Akava.*
 Woman—*Papiē.*
 World—*Aungoi bauma.*
 Year—*Kinafa.*
 Yes—*Moe.*
 Yesterday—*Vai.*
 I—*Lau.*
 Thou—*Oi.*
 He or she—*Ia.*
 We—*Lai* (exc.), *naika* (inc.).
 You—*Aumi.*
 They—*Iamo.*
 My—*Lauapu.*
 Thy—*Oia pumu.*
 His—*Ia apunga.*
 Ours—*Lai emai apumai.*
 Yours—*Komia.*
 Theirs—*Ia apunga.*

VOCABULARIES OF KOIARI GOTO AND KOITA GA
DIALECTS.

English.	Koiari Dialect.	Koita Dialect.
One	Igau	Kobuaiku.
Two	Abuti	Abu.
Three	Abuti igau	Abigaga.
Four	Abuti abuti	Abaabu.
Five	Abuti abuti igau	Adakasiva.
Six	Abuti abuti abuti	Agorokiva.
Seven	Abuti abuti abuti igau	Yatirigava.
Eight	Abuti abuti abuti abuti	Abuguveita.
Nine	Abuti abuti abuti abuti igau	Igaguveiti.
Ten	Obua	Utube.
Eleven	Obua igau	Utube hakira koboga.
Twelve	Obua abuti	Utube hakira abu.
Thirteen . . . . .	.....	Vakira abigava.
Fourteen . . . . .	.....	Vakira ababu.
Fifteen . . . . .	.....	Vakira adakisiva.
Sixteen . . . . .	.....	Vakira agorakiva.
Twenty	Obua obua, &c.	Uta abu.
Thirty . . . . .	.....	Uta abigaga.
Forty . . . . .	.....	Uta abaabu.
Fifty . . . . .	.....	Uta adakasiva.
Sixty . . . . .	.....	Uta agorokiva.
Seventy . . . . .	.....	Uta yatirigava.
Eighty . . . . .	.....	Uta abuguveiti.
Ninety . . . . .	.....	Utu igaguveiti.
One hundred . . . . .	.....	Tinahube.
One hundred and two . . . . .	.....	Tinahube hakira abu.
Two hundred . . . . .	.....	Tinahu abu.
One thousand . . . . .	.....	Dahabe.
Adze	Yavaka (stone), uma (toma- hawk).	Gumaa.
Afternoon	Vani obaragima	Vanivirehoti.
Anger	Boruko	Ho.
Arrow	Giba	Diba.
Axe	Uma	Guma.
Baby	Gamikanukanuaiki (boy), maiaokanukanuaiki (girl)	Karukare.
Bad	Komara	Dauri.
Beautiful	Iobunanagati	Magibononu.
Big	Keari	Raha.
Body	Afataniva	Ahata.
Boy . . . . .	.....	Gami.
Brother (elder)	Nani	Tataka.
Brother (younger)	Ghove	Gogoka.
Buy	Gotogoima (come to)	Hae.

English.	Koiari Dialect.	Koita Dialect.
Canoe	Eu	Eu.
Chief	Iofiobada	Lohi baugi, lohi koriko.
Child	Moeka	Mōe.
Club	Varama (disc), yorimuni (star club)	Varama (disc), kekitaka (star club).
Contract . . . .	.....	Doha.
Dark	Vaubu	Vadibu.
Daughter	Maiāo	Maiagoke.
Dead and death	Fogeraghama	Hoge.
Demon	Ghoro (guttural)	Goro.
Drink	Ima	Ebai (water).
Earth	Vata	Vatau.
East	Bonisocho (guttural)	Maireveinakasiva.
Eat	Bai	Bai.
Enemy	Gha (guttural)	Ginā.
Evening	Wohota	Vahigeitā.
Face	Vari	Ni.
Falsehood	Dona rafwhima	Gatarata.
Farewell	Yágisó	Iagiso.
Fear	Si, sigoroima	Sigoa.
Feast	Tarukima	Rigi.
Fight	Garafwhima	Garara.
Forenoon	Vararata	Vagutu ; evening, vaniu- guana; daybreak, vataita.
Friend	Divasiri	Dibiagi, divasiri.
Ghost	Goro	Ghoro (guttural).
Girl	Maiako	Maiako (singular); maio- ekea (plural).
God	Dirava	Dirava.
Good	Luuka, rugukava	Māgē.
Great	Kaiare, keari	Vamo.
Guest	Difasiri	Dei.
Gun	Ipidi	Ipidi.
Head	Kina	Omo.
Heart	Detu, uni	Soru.
Heavens	Vauni	Va.
House	Yaga	Yaga.
Hunt	Matabima, matahereima (kangaroo), ofima (men)	Meyu.
Husband	Magi	Aumabare.
Idiot	Foruforu kima	Kavagoinu.
Ill	Fufu	Komatogoina.
Inland	Gunika	Gamanagaure.
Island	Motumotu	Motumotu.
Jaw	Gaiafa	Hate.
Joint	Komuima	Rokino.
Kill	Rhama (guttural)	Gama.
Kiss	Musiva	Anogo.
Knife	Gati	Gati.
Laugh	Jati	Jati.
Life	Uriaima	Magurivanu.

English.	Koiari Dialect.	Koita Dialect.
Light	Fagaiaima	Abagava.
Little	Ramika	Amikaiki.
Man	Ata	Ata, ataunagi (plural).
Many	Oboa	Momo.
Medicine	Muramura	Muraka.
Midday	Vani korikori	Vaniomadaroghonu.
Moon	Bata	Bata.
Mother . . . .	.....	Neni, neina, aumeni.
Mountain	Numuta	Nimu.
Name	Vadibenu	Ihiva.
Night	Vaubu ; evening, wavota	Vahivi, or vafiri.
Noon . . . .	.....	Vaniomadaroghonu.
North	Mirigini	Mirigini.
Old	Vabehivemoi	Subuta.
Path	Uma (guttural)	Guma (guttural).
Payment	Damuna	Damuna.
Peace	Mai	Māi.
Present (gift)	Oubia	Herahiiaga.
Rain	Ua or va	Veni ; venigoromana, it rains.
Ringworm (scaly)	Vateka	Kobara anu.
Ringworm (not scaly)	Karuragima	Yaesa.
River	Eita	Tinavai.
Sea	Evi	Eve.
Ship	Yakatoi	Yakatoi.
Sleep	Yagima	Yaga.
Snake	Ute	Ugimaka, a white snake that comes into the house and is poisonous; uhoduka, death adder; vagimaka, carpet; yaramatago, poisonous.
Son	Gami	Gami.
Soul	Suva	Sua.
South	Fifi	Diho kasiva.
Steal	Vafuima uafuanu	Vāho.
Sun	Vani ; sunset, vaniarigagima	Vanī.
To-day	Negetu, ekenei	Negu.
To-morrow	Vararata	Vahugu.
Treaty	Mai	Torāā.
Tree	Idi	Idi.
True	Veika	Riagavaraki.
Twilight	Ekenaiguare ubaaima	Yorini homo.
Uncle	Garimenike	Mama rahai.
Village	Ogo	Ogōā.
War	Gakima	Gakiki.
Warrior	Gabia koriko	Gakikiata.
Wealth or property	Kohu	Kohoraki.
White men	Ata Kaiva	Atakai.
Wife	Mabara	Aumebare.
Wind	Fifi	Nono.

English.	Koiari Dialect.	Koita Dialect.
Woman . . .	Magi . . .	Magi.
World . . .	Mata tafigau . . .	Mata inuta.
Year . . .	Ivaro . . .	Tau.
Yes . . .	Io . . .	Erege.
Yesterday . . .	Nu . . .	Nugeraki.
I . . .	Da . . .	Dakaki, <i>or</i> da.
Thou . . .	A . . .	Ana.
He or she . . .	Eke . . .	Aū, <i>or</i> aukaki.
We . . .	Noikoa . . .	Nokaki; we two, noni; we three, abigawa.
You . . .	Yane . . .	Yana.
They . . .	Yabuia . . .	Eaukaki.
My . . .	Daiero . . .	Daiaraki.
Thy . . .	Aiero . . .	Aieraki.
His . . .	Ekeero, apuiero . . .	Auieraki.
Ours . . .	Niero . . .	Noiraki(exclusive); auia- rutanohia (inclusive).
Yours . . .	Yaiero . . .	Yaiaraki.
Theirs . . .	Yabuiero . . .	Eaueraki.

VOCABULARY OF SĀRIBA DIALECT.

One— <i>Kesega</i> .	Seventy— <i>Tatauhaiyonasemate nima-</i> <i>baubau</i> .
Two— <i>Rabui</i> .	Eighty— <i>Tatauhāsisemate</i> .
Three— <i>Haiyona</i> .	Ninety— <i>Tatauhasisemate nimabaubau</i> .
Four— <i>Hāsi</i> .	One hundred— <i>Tatauharigigi-semate</i> .
Five— <i>Harigigi</i> .	One hundred and one— <i>Tatauharigigi-</i> <i>semate kesega</i> .
Six— <i>Harigigi kesega</i> .	Adze— <i>Sepu</i> .
Seven— <i>Harigigi rabui</i> .	Afternoon— <i>Meimeilahi</i> .
Eight— <i>Harigigi haiyona</i> .	Alive— <i>Eawasi</i> .
Nine— <i>Harigigi hāsi</i> .	Anger— <i>Hedaguali</i> .
Ten— <i>Nimabaubau</i> .	Arrow— <i>Pedu</i> .
Eleven— <i>Nimabaubau kesega</i> .	Baby— <i>Meamea</i> .
Twelve— <i>Nimabaubau rabui</i> .	Bad— <i>Eababa</i> .
Nineteen— <i>Nimabaubau harigigi hāsi</i> .	Beautiful— <i>Namanamana</i> .
Twenty— <i>Taukesegamate, or tawemate</i> .	Big— <i>Rakirakino</i> .
Twenty-one— <i>Taukesegamate kesega</i> .	Boy— <i>Wawaia tau</i> .
Thirty— <i>Taukesegamate nimabaubau</i> .	Brother— <i>Egusaia</i> .
Forty— <i>Tataurabuisemate</i> .	
Fifty— <i>Tataurabuisemate nimabaubau</i> .	
Sixty— <i>Tatauhaiyonasemate</i> .	

Brother, elder— <i>Egusaia tautaubadoni</i> .	Little— <i>Gagirini</i> .
Brother, younger— <i>Egusaia kilakila-</i>	Mamma— <i>Susu</i> .
Buy— <i>Kurokuni</i> . [kaina.	Man— <i>Tamoai</i> .
Canoe— <i>Waga</i> .	Mat— <i>Leyaha</i> .
Chief— <i>Taubada</i> .	Moon— <i>Waikena</i> .
Child— <i>Wawaia</i> .	Morrow— <i>Maraitom</i> .
Comb— <i>Suari</i> .	Mountain— <i>Tupi</i> .
Daughter— <i>Natuna sine</i> .	Murder— <i>Seunui</i> .
Dead— <i>Iboitaka</i> .	Name— <i>Harina</i> .
Death— <i>Boita</i> .	Night— <i>Boni</i> .
Demon— <i>Karua</i> .	No— <i>Nigeri</i> .
Drink— <i>Kunuma</i> .	Noon— <i>Madai laki</i> .
East— <i>Tehaborime</i> .	Ocean— <i>Gabalaki</i> .
Eat— <i>Yekai</i> .	Old— <i>Tautaubada</i> .
Enemy— <i>Seyara</i> .	Pay— <i>Maisana</i> .
Evening— <i>Maimailahi</i> .	Peace— <i>Tarabini</i> .
Famine— <i>Gomala</i> .	Poison— <i>Kairewa</i> .
Farewell— <i>Kaiioni</i> .	Present— <i>Ekainawia</i> .
Fear— <i>Ematousi</i> .	Rain— <i>Nabu</i> .
Feast— <i>Soi</i> .	Reason— <i>Una</i> .
Fight— <i>Iara</i> .	Right side— <i>Kahatuina</i> .
Forenoon— <i>Maratomtom</i> .	River— <i>Sagasaga</i> .
Friend— <i>Egu heriam</i> .	Road— <i>Keda</i> .
Ghost— <i>Karua</i> .	Rum— <i>Sagena</i> .
Girl— <i>Sine kuku</i> .	Salt— <i>Karita</i> .
God— <i>Barau</i> .	Sea— <i>Gabua</i> .
Good— <i>Yenama</i> .	Ship— <i>Waga rakirakina</i> .
Great— <i>Rakirakina</i> .	Sin— <i>Mamohoi</i> .
Gun— <i>Lusa</i> .	Snake— <i>Mata</i> , (poisonous) <i>Mata dewa</i> .
Hand— <i>Nima</i> .	Son— <i>Natuna</i> .
Head— <i>Kurukuru</i> .	Soul— <i>Karuana</i> .
Heart— <i>Nuapouna</i> .	South— <i>Eawana</i> .
House— <i>Numa</i> .	South-east wind— <i>Mana erotau</i> .
Hunger— <i>Hasari</i> .	South-west wind— <i>Mana ero dobima</i>
Husband— <i>Maita wasora</i> .	Spear— <i>Wamari</i> . [saima.
Inland— <i>Nukura</i> .	Star— <i>Kipuara</i> .
Iron— <i>Pawati</i> .	Story— <i>Yehedehedede</i> .
Island— <i>Bonabonarua</i> .	Sun— <i>Mahana</i> .
Jaw (upper)— <i>Noaluna</i> .	Thank you— <i>Kagutoki</i> .
Joint— <i>Ekerokero</i> .	Tobacco— <i>Puaisa</i> .
Kill— <i>Kunoi</i> .	To-day— <i>Wau</i> .
Kiss— <i>Yepanei</i> .	To-morrow— <i>Maraitom</i> .
Knife— <i>Nigwa</i> .	True— <i>Mamohoi</i> .
Language— <i>Emahedehedede</i> .	Uncle— <i>Egusaia tamana</i> .
Left side— <i>Kahamararona</i> .	Useless— <i>Eabageru</i> .
Light— <i>Dawaia</i> .	Venomous— <i>Dewa</i> .

War—*Iyara*.
 Water—*Waira*.
 West—*Tehayarasi*.
 Wealth—*Eginauri badobadodi*.
 White men—*Dimdim*.
 Wife—*Manena*.
 Woman—*Sine*.
 Yam—*Kwatea*.
 Year—*Borimai*.
 Yesterday—*Lahi*.

I—*Yaū*.
 Thou—*Koa*.
 He or she—*Tenem*.
 We—*Kita*.
 You—*Komiu*.
 They—*Sia*.
 My—*Yogu*.
 Thy—*Koayom*.
 His or hers—*Teina*.
 Ours—*Yoda*.

VOCABULARY OF AWAIAMA (CHADS BAY) DIALECT.

One—*Emoti*.
 Two—*Ruaga*.
 Three—*Tonuga*.
 Four—*Wonepari*.
 Five—*Uritutu*.

The people of Awaiama count by fives, and keep tally of the fives by turning down a finger for each. Some of them give names for numbers up to twenty, but they are never given twice in the same order, and are either borrowed or fictitious.

Adze—*Irama*.
 Afternoon—*Amakiori*.
 Arrow—*Uiarina* or *woe*.
 Baby—*Natuna*.
 Bad—*Yapapoe*.
 Beads—*Boradimdim*.
 Beautiful—*Ihaki*.
 Body—*Duaduariga*.
 Breath—*Ahuena*.
 Brother (woman's)—*Turau*.
 Canoe, small—*Dau, wām*.
 Chief—*Taurai*.
 Child—*Tewera*.
 Cocoanut tree—*Neura*.
 Dance—*Tahara*; (v.) *harahara*.
 Dark—*Kabudaraiori*.
 Daughter—*Natuna*.
 Day—*Oiotepena*.
 Demon—*Arugo*.
 Dog—*Kaukōu*.

Drink—*Taumoma* or *taumonaia*.
 East—*Kabuda aigireta*.
 Eat—*Kanikani*.
 Evening—*Ididibara*.
 Face—*Auhabunora*.
 Farewell—*Kaihoni*.
 Fight—*Hinauni*.
 Food—*Kani kani*.
 Forenoon—*Oteporina*.
 Friend—*Mahiao*.
 Girl—*Wawine*.
 God—*Nouna*.
 Good—*Dewadewa*.
 Good-bye—*Kaihoni* or *haiyoni*.
 Guest—*Turauna hopomai unatugura*.
 Gun—*Ruta*.
 Head generally—*Kareana* or *karena*.
 Heavens—*Budibudi*.
 House—*Numa*.
 Iron—*Irama*.
 Island—*Kaikaina*.
 Jaw, lower—*Wahena*.
 Jump—*Rupa*.
 Kill—*Heuni*.
 Kiss—*Amakahinami*.
 Knife—*Kwatye kwatye*.
 Land—*Hapadoa, hapatado*.
 Left side—*Kahamaropona*.
 Liar—*Rawa hirugudadani*.
 Little—*Kaikaina*.
 Man—*Rawa*.

Many— <i>Magomagouna</i> .	Sing— <i>Tata paroro</i> .
Moon— <i>Nawarawi</i> .	Sleep— <i>Taneno</i> .
Morning— <i>Amakigereta</i> .	Son— <i>Natuna</i> .
Mouth— <i>Gamota</i> .	South-east— <i>Boriborima</i> .
Name (s.)— <i>Goana</i> .	Star— <i>Gamaiawe</i> .
Night— <i>Oimarotom</i> .	Sun— <i>Kabudara</i> .
No— <i>Ega</i> .	Tall— <i>Dawodawona</i> .
Nose— <i>Niu</i> .	To-day— <i>Utanima</i> .
Old— <i>Hautimagamagona</i> .	To-morrow— <i>Mariayahi</i> .
Owl— <i>Boma boma</i> .	Tree— <i>Rogana</i> .
Oyster— <i>Karitao</i> .	True— <i>Moina</i> .
Paddle (s.)— <i>Woe</i> .	Upwards— <i>Inataora</i> .
Payment— <i>Buga</i> .	Village— <i>Dagiroro, hainuma</i> .
Peace— <i>Madawa unootu</i> .	Walk— <i>Nae</i> .
Poison— <i>Paroma</i> .	War (s.)— <i>Hinauni</i> .
Present (gift)— <i>Apawarem kaikaina</i> .	Warrior— <i>Gawia</i> .
Rain— <i>Gunuma</i> .	West— <i>Uaguaraiya</i> .
Right side— <i>Katuna</i> .	White men— <i>Dimdim</i> .
River— <i>Hagahaga</i> .	Wife (spouse)— <i>Itawino</i> .
Roof— <i>Paruparutu</i> or <i>gatowi</i> .	Woman— <i>Wawine sinasina</i> .
Sail— <i>Dana, ureure</i> .	Write— <i>Utona</i> .
Salt— <i>Niha</i> .	Yes— <i>Ena, dobu</i> .
Sea— <i>Niha</i> or <i>nihaboga</i> .	Yesterday— <i>Pōm</i> .
Ship— <i>Wara</i> .	I— <i>Tauyai</i> .

VOCABULARY OF MURUA (WOODLARK ISLAND) DIALECT.

One— <i>Koitan</i> .	Afternoon— <i>Kwaiaro</i> .
Two— <i>Kweyu</i> .	All— <i>Tamwaia</i> .
Three— <i>Kweiton</i> .	Anger— <i>Kagumoni</i> .
Four— <i>Kweivas</i> .	Arrow— <i>Gipoi</i> .
Five— <i>Kweinim</i> .	Baby— <i>Kwapao</i> .
Six—Same as one.	Bad— <i>Igégi kum sinápu</i> .
Seven—Same as two.	Beautiful— <i>Nāmno boéni</i> .
Eight—Same as three.	Blood— <i>Buiavi</i> .
Nine—Same as four.	Body— <i>Wogu</i> .
Ten— <i>Sinawatan kasuratan</i> .	Bright— <i>Bunoboéni, tibukóna</i> .
Twenty— <i>Sinawaiyu</i> .	Brother (woman's)— <i>Nagutu</i> .
Thirty— <i>Simawaton</i> .	Brother (man's elder)— <i>Tuwagi tava-</i> <i>kaini</i> .
Forty— <i>Sinawas</i> .	Brother (man's younger)— <i>Wadagu</i> <i>munawainai</i> .
Fifty— <i>Sinawanimi</i> .	Buy— <i>Tagimare</i> .
	Canoe, large, with sail— <i>Kavakaini</i> .
	Canoe, small— <i>Kakaikiti</i> .

There was some reason to believe that there are different numerals for numbers of certain specified articles, but the ordinary numerals are the above.

Carving— <i>Ireres</i> .	Name (s.)— <i>Yagani</i> .
Chief— <i>Guiáo</i> .	Night— <i>Ibogu</i> .
Come— <i>Kuma</i> .	No— <i>Naga</i> .
Dance— <i>Sari</i> , <i>kaiwosa</i> , or <i>aiwosa</i> .	Noon— <i>Yanai</i> .
Daughter— <i>Natu</i> .	Oar— <i>Vai</i> .
Day— <i>Ikivi isi</i> .	Old— <i>Kvaimungu</i> .
Dead and die— <i>Imati</i> .	Orange— <i>Kavakoku</i> .
Demon— <i>Bagau</i> .	Paddle (s.)— <i>Ravisi</i> .
Dog— <i>Kauuku</i> , <i>ausimao</i> .	Peace— <i>Uroosi</i> .
Downwards— <i>Ikaróu</i> .	Pig— <i>Buruka</i> .
East— <i>Bwarimi</i> .	Plenty— <i>Babao</i> .
Eat— <i>Kumukwam</i> , <i>kaboegi</i> , <i>akwam</i> .	Present (gift)— <i>Aseakai mowana</i> .
Enemy— <i>Sivinani</i> .	Rain— <i>Kwesi</i> .
Evening— <i>Seriri</i> , <i>kwaiyavi</i> , <i>karasi</i> .	Reply— <i>Mwani</i> .
Face— <i>Magini</i> .	Right side— <i>Katai</i> .
Falsehood— <i>Kuiaede</i> .	Rob (v.)— <i>Takwai</i> .
Family— <i>Kaipuri</i> .	Sea— <i>Kaisáe</i> .
Farewell— <i>Tanemo</i> .	Sister (man's)— <i>Naguti</i> .
Father— <i>Tamana</i> .	Sister (woman's elder) — <i>Vinomai naguti</i> .
Feast— <i>Mona</i> .	Sister (woman's younger)— <i>Badani</i> .
Fire— <i>Kova</i> .	Son— <i>Kaneyobu</i> .
Food— <i>Kān</i> .	Soul— <i>Kavanana</i> .
Forenoon— <i>Gabogo</i> .	Star— <i>Utuni</i> .
Friend— <i>Aseekaimuan</i> .	Story (tale)— <i>Tireriu</i> .
Girl— <i>Vinai</i> .	Sun— <i>Karasi</i> .
God— <i>Yovana</i> .	Sunrise— <i>Barimi</i> .
Good— <i>Boēna</i> .	Sunset— <i>Yavati</i> .
Guest— <i>Agunatau</i> .	Talk— <i>Rivani</i> .
Gun— <i>Káirusi</i> .	Think— <i>Seki</i> .
Heart— <i>Ikuiaku</i> .	To-day— <i>Nagena</i> .
Heavens— <i>Kirbemeti</i> .	To-morrow— <i>Nuboigă</i> .
House— <i>Bwani</i> .	Treaty— <i>Kumtakaiwana takanivi</i> .
Husband (spouse)— <i>Gunakwari</i> .	True— <i>Mounidi</i> .
Inland— <i>Tanesi waraovai</i> .	Twilight— <i>Iseriri</i> .
Island— <i>Vēina</i> .	Ugly— <i>Namgagi</i> , <i>nerberebi</i> .
Iron— <i>Onomunumu</i> .	Uncle (maternal and paternal)— <i>Tamagu</i> .
Land— <i>Nibunabu</i> .	Village— <i>Veni</i> .
Left side— <i>Kimao</i> .	War (s.)— <i>Ipinsi</i> .
Life— <i>Imóave</i> .	Warrior— <i>Nevi</i> .
Little— <i>Kakiti</i> .	Wealth or property— <i>Babau inavavagi babau nauriogu</i> .
Man— <i>Gamaga</i> , <i>tau</i> .	White men— <i>Gĩmesépu</i> .
Many— <i>Babau</i> .	Wife (when spoken of by husband)— <i>Tuagu</i> .
Midday— <i>Yanai</i> .	
Moon— <i>Wikéni</i> , <i>tibukōne</i> .	
Mother— <i>Inagu</i> .	
Mouth— <i>Kauani</i> .	

Wife (spouse)—*Yodi*.

Woman—*Vini*.

World—*Ravuni veni*.

Year—*Kotanoch barimi*.

Yes—*Néa, monidi*.

Yesterday—*Nóevi*.

What—*Avea kankivagi*.

I—*Yegu*.

Thou—*Yakom*.

He or she—*Kanmaneti, kaniakesi mit-
owen*.

We—*Yakaimi*.

We (two)—*Kaditei*.

We (three)—*Kaditeitonu*.

We (all)—*Kadabebáosa*.

You—*Yakamiyi*.

You (two)—*Kamitei*.

You (three)—*Kamiteitonu*.

All of you—*Yakami amibabau*.

They—*Towéaka*.

Ours—*Yaka mānawan*.

Our (two) boat—*Idau waga katenoka*.

Our (three) boat—*Idau waga kadite-
tonu*.

Our (of many) boat—*Kaditeinimi idau
waga*.

Yours—*Mivevag*.

Theirs—*Tasiasu*.

Each—*Ura ta nok avere*.

VOCABULARY OF MISIMA (ST. AIGNAN) DIALECT.

One—*Maisena*.

Two—*Rabui*.

Three—*E'tun*.

Four—*E'pat*.

Five—*Nimanapanuna*.

Six—*Nimanapanuna maisena*.

Seven—*Nimanapanuna rabui*.

Eight—*Nimanapanuna etun*.

Nine—*Nimanapanuna épat*.

Ten—*E'rutéga*.

Eleven—*E'rutéga maisena*.

Twelve—*E'rutéga rabui*.

Twenty—*E'rurua*.

Thirty—*E'rurutun*.

Forty—*E'rurupat*.

Fifty—*E'rurusuwa*.

Sixty—*E'rurunima*.

Seventy—*E'rurupit*.

Eighty—*E'ruruwon*.

Ninety—*E'ruruyawata*.

One hundred—*E'rurubagabaga*.

One hundred and two—*E'rurubagabaga
rabui*.

Two hundred—*E'rurubagabaga eruru-
bagabaga*.

Afternoon—*Arati, nuwana*.

All—*Giugiu*.

Anger—*Saiea*.

Bad—*Inaken*.

Birth—*Iyab*.

Boy—*Warwaia*.

Brother—*Tariu*.

Brother, elder—*Tariu gamahun*.

Brother, younger—*Tariu nomirumiru*.

Buy—*Papamora*.

Canoe—*Keibai*.

Chief—*Tonowaken, babara*.

Child—*Kumimi*.

Comb—*Huall*.

Dance—*Lahus*.

Daughter—*Irian*.

Day—*Lan*.

Dead—*Ariga*.

Death and die—*Yariga*.

Deceit—*Kakawi*.

Drink—*Naiim*.

East—*Nati*.

Eat—*Anan*.

Enemy—*Saia*.

Evening—*Irubiken*.

Face— <i>Manenila</i> .	Rain— <i>Keihi</i> .
Fight— <i>Naruriwa</i> .	Right side— <i>Mamaówa</i> .
Fire— <i>Ginaha</i> .	River— <i>Sinnauweil</i> .
Fish— <i>Morti</i> .	Sea— <i>Bagur</i> .
Food— <i>Tiniikia</i> .	Ship— <i>Boboana</i> .
Forenoon— <i>Manuria</i> .	Sister— <i>Nohu</i> .
Forest— <i>Waruwaru</i> .	Sleep— <i>Keinu</i> .
Friend— <i>Helia</i> .	Son— <i>Eriam</i> .
Girl— <i>Garoken</i> .	South— <i>Rorrau</i> .
Give— <i>Upeim</i> .	South-east wind— <i>Balliman</i> .
Good— <i>Iwaisa</i> .	Star— <i>Rarara</i> .
Great— <i>Bobotana</i> .	Sun— <i>Hilahila</i> .
Hand— <i>Niman</i> .	To-day— <i>Nasi</i> .
Head— <i>Korkor</i> .	To-morrow— <i>Barimoga</i> .
Heart— <i>Arti</i> .	True— <i>Kakawi</i> .
House— <i>Limi</i> .	Twilight— <i>Gumila</i> .
Husband— <i>Wasara</i> .	Warrior— <i>Lavia</i> .
Kill— <i>Taurema</i> .	Water— <i>Weweil</i> .
Kiss— <i>Patarausis</i> .	West— <i>Paii</i> .
Left side— <i>Gegebara</i> .	White men— <i>Dimdim</i> .
Little— <i>Kakaisa</i> .	Wife— <i>Ewaisa</i> .
Long— <i>Iapu</i> .	Woman— <i>Yowau</i> .
Man— <i>Gamagan</i> .	Yam— <i>Anan</i> .
Many— <i>Igiugiui</i> .	Yes— <i>Tarum</i> .
Midday— <i>Aratinuana, arati</i> .	Yesterday— <i>Boru</i> .
Moon— <i>Papahana, waikeina</i> .	I— <i>Naú</i> .
Mountain— <i>Oiya</i> .	Thou— <i>Owa</i> .
Name— <i>Arameik</i> .	He or she— <i>Ia</i> .
Night— <i>Masigil</i> .	My— <i>Erow</i> .
No— <i>Ekaisi</i> .	Thy— <i>Oram</i> .
Noon— <i>Aratinuana, arati</i> .	His— <i>Erana</i> .
North— <i>Waiyek</i> .	Ours— <i>Avarau</i> .
North-west— <i>Yahara</i> .	This— <i>Eriau</i> .
Old man— <i>Tono wak</i> .	That— <i>Bugali</i> .
Old woman— <i>Navenak</i> .	Another— <i>Bismaigena</i> .
Path— <i>Kamasa, keira</i> .	Who— <i>Evaro</i> .
Peace— <i>Negia</i> .	What— <i>Hownagun</i> .
Present (gift)— <i>Waheim</i> .	

VOCABULARY OF TAGULA (SUDEST) DIALECT.

One— <i>Rega</i> .	Five— <i>Golima</i> .
Two— <i>Reu</i> .	Six— <i>Koona</i> .
Three— <i>Goto</i> .	Seven— <i>Apiru</i> .
Four— <i>Kovaru</i> .	Eight— <i>Vawa</i> .

Nine—*Vatchiu*.
 Ten—*Ewara*.
 Eleven—*Ewara rega*.
 Twelve—*Ewara reu*.
 Twenty—*Yaivo*.
 Thirty—*Yeto*.
 Forty—*Yavaru*.
 Fifty—*Yolima*.
 Sixty—*Yoonā*.
 Seventy—*Yapira*.
 Eighty—*Yooa*.
 Ninety—*Yosiwa*.
 One hundred—*Tangara*.
 One hundred and two—*Tangara reu*.

 Afternoon—*Yaviyavia*.
 Alien (foreigner)—*Lamulumu*.
 Anger—*Bada*.
 Answer—*Adagi*.
 Arrow—*Báthe*.
 Ask—*Raitena*.
 Baby—*Gama*.
 Bad—*Ithave*.
 Beautiful—*Tabuiya*.
 Boy, big—*Lahi*.
 Boy, small—*Gamangama*.
 Boys in general—*Roli*.
 Bright—*Ira*.
 Brother—*Rawanda*.
 Brother, younger—*Rawanda imaiani*.
 Buy—*Vamoda*.
 Canoe—*Waga*.
 Chief—*Gia, bagodu*.
 Club—*Dobu*.
 Comb—*Thue*.
 Cook—*Turio*.
 Cry—*Raranda*.
 Dark—*Gaugau*.
 Day after to-morrow—*Ugoia*.
 Day, to—*Nora*.
 Die—*Imara*.
 Don't know—*Dagareda*.
 Earth—*Ibete*.
 East—*Igivia*.
 Eat—*Kanega*.
 Enemy—*Thuia*.

Evening—*Ganaga*.
 Face—*Yamanda*.
 Father—*Ramandrāau*.
 Fire—*Riu*.
 Food—*Ranega*.
 Friend—*Amerora*.
 Good-night—*Avoli*.
 Girl—*Wevu*.
 Good—*Thavuye*.
 Great—*Lagia*.
 Head—*Balinda*.
 Heart—*Ligaravivira vira*.
 House—*Gola*.
 Husband—*Ivinadu*.
 Island—*Deida*.
 Kiss—*Rāwuru*.
 Know—*Kaūlungwe*.
 Large—*Lagia*.
 Left hand—*Nimanda*.
 Leg—*Biai*.
 Lie—*Kwana*.
 Light—*Iwilu*.
 Male—*Jajana*.
 Man—*Umoru*.
 Many—*Royalu*.
 Midday—*Ararage*.
 Moon—*Wagina*.
 Morning—*Givia*.
 Mother—*Nava, tinagu*.
 Name—*Idanila*.
 Night—*Igogo*.
 No—*Ai, auwu*.
 Noon—*Ararage*.
 North—*Vanga*.
 Olden time—*Bokarumeru*.
 Ours—*Imew*.
 Peace—*Degaregāreda*.
 Piece—*Nasie*.
 Pig—*Bombo*.
 Rain—*Uwi*.
 Riches—*Gia*.
 Right hand—*Uwaiu*.
 Road—*Kamāde*.
 Sacred—*Yaregana*.
 Sail—*Muina*.
 Sea—*Jiur*.

Ship—*Inu*.
 Sister—*Lauo*.
 Sky—*Wuttara*.
 Sleep—*Ragena*.
 Son—*Naruye*.
 Son-in-law—*Rerea wani*.
 Sun—*Varai*.
 They—*Duwa*.
 Thine—*Lanambu*.
 Thou—*Renu*.
 Time—*Waringariba*.
 To-morrow—*Uvole, govoli*.
 True—*Naikwani*.
 Twilight—*Nengia elangwa*.
 Warrior—*Ungauwi*.
 Water—*Buā*.
 West—*Yauyauyerewa*.
 Widow—*Iman*.
 Wind (north)—*Waiwabu*.
 Wind (south)—*Evala*.

Wind (south-east)—*Boimba*.
 Wind (south-west)—*Yambau*.
 Woman—*Wevu*.
 Yes—*H'm*.
 Yesterday—*Menda*.

I—*Giya*.
 Thou—*Kwenu*.
 He—*Andanka*.
 We two—*Vagewu*.
 You two—*Deukuwa*.
 They two—*Degewu*.
 We three—*Tagato*.
 They—*Imena*.
 His—*Linambo*.
 Ours—*Lanambo*.
 Yours—*Lunam bomboriga*.
 Theirs—*Boidinagia*.
 Each—*Waraiua*.

COLLECTION OF WORDS OF ROSSEL ISLAND DIALECT.¹

Rossel Island—*Duba* (according to natives of bay where steamer anchored).
 Village opposite steamer—*Ba*.
 Village inland from steamer—*Yebo*.
 Village on hill to west—*Tambuigo*.

NOUNS.

Lime-spoon—*Cha*.
 Basket—*Be*.
 House or village—*Ngoa*.
 Eye—*Ngambi*.
 Nose—*Niu*.
 Mouth—*Ngon* (French *on*).
 Tooth or teeth—*Niau*.
 ps (?)—*Ngon*.
 Hair—*Mbeur* (the *eu* like the *e* in "her").
 Hand—*Geur* (the *eu* like the *e* in "her").

Arm—*Bwoa*.
 Fingers—*Dibu*.
 Foot—*Yindu*.
 Leg—*Bali*.
 Torres Strait pigeon—*Ngam*.
 Blue pigeon—*Mui*.
 Stick or pole used as frame of house—*İi*.
 Banana fruit—*Yeu* (pronounced like the French word "yeux").
 Hair-comb—*Djeba*.
 Ear—*Ngoadā*.
 Man—*Bi*.
 Boy—*Dieu* (exactly like French).
 Woman—*Bia*.
 Girl—*Daru*.
 Tongue—*Deu* (exactly like French).
 Nose ornament—*Niu*.
 Lime-gourd—*Go* (the *o* is the *o* in "God").

¹ Compiled by the Hon. F. P. Winter.

Knife—*Peno*.
 Pig—*Boama*.
 Dog—*Wong*.
 Fire—*Dua*.
 Water—*Mbua*.
 Stone—*Djab*.
 Coral—*Uwa*.
 Nautilus shell—*Tidikalili*.

VERBS.

Come—*Abui*.
 Go—*Dau*.
 Cut with knife—*Giau*.

ADJECTIVES.

Good—*Gilemba* (?) *mauwa*.

NUMERALS.

Apparently Correct.

One—*Munda* (the *u* in “bun”).
 Two—*Miwa*.
 Three—*Pieli* or *bieli*.
 Four—*Bai*.
 Five—*Limi*.
 Six—*Wene*.
 Seven—*Biri*.
 Eight—*Wiali*.
 Nine—*Diu*.
 Ten—*Ya*.

Doubtful.

Eleven—*Yamamunda*.
 Twelve—*Yamamiwa*.
 Twenty—*Umulamiwa*.
 Thirty—*Yepieli*.
 Forty—*Yabai*.
 Fifty—*Yei*.

COMPARATIVE VIEW OF NEW GUINEA DIALECTS.¹

English.	Motu.	Kerepunu.	Aroma.	South Cape.	Kabadi.	Maiva.	Motumotu.
Above	atai.	ahai.	rai.	eva.	aruna.	uvi.	orari.
All	ibounai.	maparana.	mapararia.	gamagari.	bounana.	ikoinai.	foromai.
Arrow	diba.	riba.	ripa.	...	dibana.	paki.	farisa.
Ask	nanadai.	verenagi.	lenaki.	hesio.	rauaina.	vakaivakai.	...
Bad	dika.	raava.	rabaraba.	balaa.	kaka.	kia.	maroro.
Blood	rara.	rala.	rara.	osisina.	rara.	aruaru.	ovo.
Body	tau.	hau.	hau.	tau.	kau.	hau.	...
Boy	mero.	melo.	mero.	merumeru.	urame.	miori.	siare.
Brother (younger)							
or sister	tadina.	arina.	arina.	anataumurita.	kadina.	hatina.	marehari.
Brother (elder)	kakana.	arina.	kuine.	tuahana.	kadina.	aana.	paua.
Buy (or sell)	hoihoi.	voivoi.	boiboi.	uneune.	inaina.	kavakava.	itaialoi.
Chief	lohia.	vere.	belegaua.	kuiau.	ovia.	ovia.	pukari.
Clothes	dabua.	rapuga.	labua.	ruru.	kupuna.	havuni.	puta.
Conquer	qalimu.	walimu.	belavi.	adidiri.	oaka.	aivala.	ivara.
Dance	mavaru.	bara.	palapala.	saga.	varia.	euā.	eoi.
Day (to-)	harihari.	ivagomona.	evanamo.	uauta.	iavaruna.	bariu.	melu.
Day (after to-morrow)							
morrow)	vanegai.	vaomanai.	walelepokoni.	huana.	maranina.	elani.	a.
Die	mate.	wareha.	walega.	mate.	ekeo.	ari.	opai.
Don't know	sedila.	bana.	pilamu.	bai.	inanō.	iamotaina.	auaro.
Earth	tano.	vano.	arima.	tano.	kanona.	hano.	oti.
East	maireveina.	abuano.	walau.	vaeau.	kaeaona.	tototaina.	kauritupe.
Eat	ania.	ania.	kanikani.	uai.	eaniva.	moana.	laria.
Eight	taurahani.	auravaivai.	auravaivai.	harigighaiona.	karavani.	avavani.	...
Evening	adorahi.	lavilavi.	labilabi.	mailahi.	raviravi.	lavilavi.	mefautu.
Eye	mata.	ma.	māna.	mata.	maka.	maha.	ofae.
Father	tamana.	amana.	amana.	tamana.	auanana.	hamana.	oa.
Feast	aria.	verewa.	lewa.	soi.	naku.	uadena.	sosoka.
Fire	lahi.	arova.	alova.	vaki.	auaraara.	iruva.	ahari.

¹ Compiled by the Rev. W. G. Lawes.

COMPARATIVE VIEW OF NEW GUINEA DIALECTS (*Continued*).

English.	Motu.	Kerepunu.	Aroma.	South Cape.	Kabadi.	Maiva.	Motumotu.
Five . . .	ima.	imaima.	imaima.	harigigi.	ima.	ima.	oroka oroka me farakeka.
Food . . .	malamala.	aniani.	wala.	aiai.	kepana.	pohama.	rariaetau.
Friend . . .	turana.	hana.	gana.	enaheriamu.	enakauna.	enahau.	moraitai.
Girl . . .	kekeni.	iao.	iao.	siu.	vaisi.	uahouaho.	bori.
God . . .	dirava.	barahu.	balau.	eaubada.	dirava.	tirama.	karisu.
Good . . .	namo.	nama.	nama.	iroro.	nonoa.	namona.	laleva.
Good night . . .	bamahuta.	bamahu.	alovaialu.	aioni.	kamaenō.	haparua.	iavaino.
He . . .	ia.	ia.	ia.	ia.	iana.	ia.	areo.
Head . . .	qara.	repa.	lepa.	nagara.	roona.	ara.	arofave.
Heart . . .	kudou.	lau.	malaha.	tutueveu.	nuana.	aoakoi.	hai.
His, hers . . .	ena.	gena.	gena.	enana.	ena.	ena.	areve.
Hundred . . .	sinahu.	inavu.	inabuna.	tataoharigigi simate.	poupou.	hinavu.	...
I . . .	lau.	au.	lau.	eau.	nana.	au.	ara.
Jealous . . .	vagege.	vagege.	wagege.	siaiau.	vaiora.	vaki'a.	hai alala.
Kiss . . .	aherahu.	veveravu.	pebarabu.	alagoi.	kevaipauva.	pauna.	meresisi.
Know . . .	diba.	riba.	ripana.	ata.	isanava.	iovina.	ore.
Large . . .	bada.	gamu.	para.	lailai.	babaka.	apauana.	rovaea.
Left hand . . .	lauri.	auri.	auli.	seuseuri.	earina.	aoari.	maiava.
Life . . .	mauri.	maguri.	mauri.	mauri.	mauri.	mauri.	makuri.
Light . . .	diari.	maea.	malagani.	marana.	rani.	eā.	ovava.
Male . . .	maruane.	maruwane.	maruane.	tamoana.	kauna.	koa.	kaisava.
Man . . .	taunimanima	aunirimarima.	aunilimalima.	tatao.	kauda.	maearima.	karu.
Man (as opposed to woman)	tau.	hau.	au.	tau.	kau.	hau.	vita.
Many . . .	hutuma.	guma.	uma.	kamagari.	ko'unana.	mako.	rauapo.
Mine . . .	egu.	gegu.	geku.	enagu.	euna.	e'u.	arave.
Moon . . .	hua.	vue.	bue.	navalai.	uena.	naoa.	papare.

Morning	.	daba.	lapa.	lapa.	maraietomu.	kabaerere.	lani.	miori.
Mother	:	sinana.	inana.	inana.	sinana.	aidana.	hinana.	lou.
Mother (or father)	:	ravana.	ahama.	agana.	bosiana.	ravana.	ravana.	ova
in-law								
Name	.	ladana.	arana.	arana.	esana.	akanana.	atana.	rare.
New	.	matamata.	valiguna.	walibuna.	harihariuna.	makamaka.	mahamaha.	are.
Night.	.	hanuaboi.	vanugabogi.	banuabogi.	eanuaboni.	vapukana.	lavi.	faita.
No	.	lasi.	aikina.	noaia.	nige.	ve'o.	ahai.	kao.
One	.	tamona.	obuna.	abuna.	esega.	kapea.	hamomona.	farakeka.
Only	.	sibona.	gerehana.	kerekana.	iabomu.	sipona.	kipona.	haria.
Ours (exclusive)	.	ai emai.	aigema.	aigemai.	aienamai.	naida emai.	aiemai.	erove.
Pain	.	hisihisi.	vivi.	bibi.	anumuna.	nuunuva.	haiara.	hehea.
Peace.	.	maino.	maino.	maino.	roni.	maino.	vaivua.	tairu.
Power (generally	.	siahu.	iavu.	iabu.	gigibori.	siau.	hiavu.	aihehea
supernatural)								
Rain	.	medu.	gupa.	kupa.	nabu.	upa.	avara.	rai.
Relations	.	varavara.	warawara.	warawara.	ehana.	koaena.	hatiaana.	paumarehari.
Riches	.	kohu.	dinaha.	laua.	gogo.	dinada.	kepu.	etau.
Right hand	.	idiba.	riba.	riba.	tutuna.	idibana.	itipa.	toare.
Road	.	dara.	raopara.	lara.	dopila.	keré'a.	taeara.	otiharo.
Sea	.	davara.	rama.	rama.	gabogabo.	kavara.	aku.	saea.
Seven.	.	hitu.	mabere aura- vaivai.	auraoi wabuna.	harigigi rabui.	karakoi kapea.	avaihau hamo- mona.	.....
Ship	.	lakatoi.	lakaoui.	rakaoui.	vaka.	aunakoi.	aunohi.	vavaea.
Sister.	.	taihuna.	arina.	arina.	rouna.	a'opana.	haivuna.	uaroa.
Six	.	tauratoi.	auraoi.	aulaoi.	harigigi esega.	karakoi.	avaihau.	.....
South.	.	diho.	aburigo.	gaburigo.	.....	asiaona.	ahidaina.	seipi.
Spirit.	.	lauma.	avuavu.	laupa.	earuiarua.	lauma.	auva.	ove.
Star	.	hisiu.	givu.	biu.	ibora.	visiu.	vihiu.	koru.
Strong	.	goada.	iriga.	iliga.	adidiri.	iraa.	tavura.	rofo.
Sun	.	dina.	haro.	garo.	mahana.	akona.	veraura.	sare.
Ten	.	qauta.	harana.	kapanana.	saudoidoi.	ouka.	harauphaea.	.....
Theirs	.	edia.	geria.	geria.	enadi.	eda.	ekia.	eleve.

COMPARATIVE VIEW OF NEW GUINEA DIALECTS (*Continued*).

English.	Motu.	Kerepunu.	Aroma.	South Cape.	Kabadi.	Maiva.	Motumotu.
They . . .	idia.	ila.	ira.	isi.	iada.	ia.	ereo.
Thine . . .	emu.	gemu.	gemu.	enamu.	emuna.	emu.	ave.
Thou . . .	oi.	oi.	goi.	oa.	onina.	oi.	ao.
Three . . .	toi.	oi.	oi.	haiona.	koi.	aiha.	oroisoria.
Time . . .	nega.	homana.	arioma.	huiana.	enona.	homa.	mea.
Two . . .	rua.	lua.	lua.	rabui.	rua.	rua.	oraokaria.
Village . . .	hanua.	vanuga.	banua.	eanua.	vanua.	aiara.	karikara.
Voyage (to go) . . .	hiri.	viri.	rapu.	ivotu.	lio.	viri.	salima.
War . . .	alala.	veali.	beali.	iala.	akuaku.	ou.	sasari.
Water . . .	ranu.	nanu.	nalu.	goila.	veina.	vei.	ma.
We (exclusive) . . .	ai.	ai.	ai.	ai.	naida.	ai.	ero.
We (inclusive) . . .	ita.	ia.	ia.	ita.	isada.	aika.	leao.
West . . .	tahodiho.	avurigo.	bagiriwa.	eavana.	variana kaiva-nai.	tivotaina.	diho.
Wind . . .	lai.	agi.	agi.	mana.	avivina.	vaura.	miruru.
Wind, north . . .	mirigini.	valaka.	gabuanu.	beubeu.	marairana.	maraira.	maruru.
Wind, south-east . . .	laulabada.	vahau.	wāiau.	aruabu.	vareana.	vaula.	mauta.
Wind, north-east . . .	rahara.	avala.	eapala.	lalasi.	revona.	varuru.	avara.
Woman . . .	haine.	vavine.	babine.	sine.	vavine.	vavine.	ua.
Yes . . .	oi be.	ina.	namu.	e. aboiesaha.	ea.	aia.	a.
Yesterday . . .	varani.	varahani.	waragani.	lahi.	ravina.	uarani.	area.
You . . .	umui.	omi.	mui.	omiu.	uida.	uai.	eo.
Young man . . .	tauhau.	haugorua.	koloa.	heviri.	oreore.	hivito	milofu.

VOCABULARY OF BULA'A DIALECT, SPOKEN IN THE CENTRAL DISTRICT OF BRITISH NEW GUINEA BY SOME COAST TRIBES.

PREFACE TO BULA'A LANGUAGE BY R. GUISE, Esq.

The words given in this Vocabulary are those in use among the middle-aged men. The rising generation coin many words, as well as change words by affected pronunciation, which are gradually introduced into the language, and in time come to be accepted—not as “slang.” This, with constant feuds and internecine wars, no doubt accounts in great part for the great dissimilarity of the different dialects.

Very few of the words in which the ballad “Leku-leku” is written are in use at present.

The dialect is similar to Motu in grammar and in the peculiar dissection of the possessive pronoun, but differs somewhat in its alphabet. It has no *h*. In words of similar roots and meaning, where the Motuan uses an *h* the Bulá'an supplies a *v* in its place. Examples :—

Motu—Hamaori.
Hadipaia.

Bulá'a—Vamaguli.
Vadipa.

In cases in which the *v* is not adopted, a very slight pause is made, as in “Bula'a.” Inland tribes in the neighbourhood, who also cannot pronounce this letter, substitute a *g*.

Unlike the Motu alphabet, this language possesses a *w*, but has no *s*, a *t* taking its place. They cannot pronounce two consecutive consonants, nor can they terminate a word with a consonant. The letter *m* is the only exception to the latter rule, as in “kam'-kam'” (big) and “kom'” (sugar-cane). Even in these exceptions there is a suspicion of a vowel termination. In words ending with the syllable *-na*, these two letters are frequently dropped—more in carelessness, it would appear.

Interchangeable letters—*d*, *l*, and *r* ; *v*, *p*, and *b* ; *v* and *w* (rarer).

There appears to be no method of indicating the plural—one exception only, “auna” (man), “au” (men).

As in Hindostani, a question is distinguished by inflection of voice only.

The language is very prolific in guttural *k*'s and *g*'s, which makes it almost as expressive in vituperation as the German tongue.

One—*Ka* or *koapuna*.
Two—*Lua-lua*.
Three—*Koi-koi*.
Four—*Vaivai*.
Five—*Ima-ima*.
Six—*Kaulakoi*.

Seven—*Mapereaulavaivai*.
Eight—*Kaulavaivai*.
Nine—*Mapere-ka-gahalana*.
Ten—*Gahalana*.
Eleven—*Gahalana koapuna*.
Twelve—*Gahalana lua-lua*.

Twenty—*Gahala lua-lua*.
 Thirty—*Gahala koi-koi*.
 Forty—*Gahala vai-vai*.
 Fifty—*Gahala ima-ima*.
 Sixty—*Gahala kaulakoi*.
 Seventy—*Gahala mapereaulavaivai*.
 Eighty—*Gahala kaulavaivai*.
 Ninety—*Gahala mapere-kagahalana*.
 One hundred—*Inabuna*.
 One hundred and two—*Inabuna lua-lua*.
 Two hundred—*Inabu lua-lua*.
 One thousand—*Rahanana*.
 Ten thousand—*Rabuia*.
 One hundred thousand—(No term).

Adze, of stone—*Kare-kare*.
 Afternoon—*Lavi-lavi*.
 Alien (foreigner)—*Tauau*.
 All—*Maparana, maguguluna*.
 Arrow—*Ripa*.
 Ask (*i.e.*, beg)—*Noge-noge*.
 Baby—*Kivani*.
 Bad—*Rakava*.
 Beautiful—*Namo-veha*.
 Big—*Kamu*.
 Blood—*Rala*.
 Body—*Aunipara*.
 Brother, woman's—*Ari*.
 Brother, man's elder—*Wala-wala, ari kune*.
 Brother, man's younger—*Ari muliai*.
 Buy—*Voia*.
 Canoe—*Ai*.
 Chief—*Veleko*.
 Child—*Nau*.
 Come—*Veamai*.
 Daughter—*Nau iona*.
 Day—*Oma*.
 Dead and death—*Kwarea*.
 Devil—*Wara*.
 Dream—*Nivi*.
 Drink—*Niu*.
 Ear—*Kea*.
 East—*Abu ano*.
 Eat—*Ania*.

Egg—*Aui*.
 Enemy—*Veali*.
 Evening—*Lavi-lavi*.
 Face—*Waila*.
 Falsehood—*Kila wapaku*.
 Farewell—*Ono máau*.
 Father—*Ama*.
 Fire—*Kalova*.
 Forenoon—*Rapa*.
 Friend—*Ana*.
 Ghost—*Wara*.
 Girl—*Iao*.
 Give—*Venia*.
 Go—*Ao, lakagia*.
 God—*Palagu*.
 Good—*Nama*.
 Guest—*Wari-wari*.
 Gun—*Piti*.
 Half—*Koruna, kavana*.
 Hand—*Gima*.
 Head—*Waila*.
 Heart—*Kutou*.
 Heavens—*Kupa*.
 House—*Numa*.
 Hunger—*Vio*.
 Husband, spouse—*Arawana*.
 Ill—*Vi*.
 Interpret—*Karo vagelegele*.
 Iron—*Auri*.
 Island—*Mou*.
 Joint—*Apo-apo*.
 Jump—*Bori*.
 Kill—*Vagia*.
 Kiss—*Vevelabu*.
 Knife—*Pao*.
 Language—*Karo*.
 Liar—*Wapakau auna*.
 Life—*Maguli*.
 Light (*s.*)—*Maeka*.
 Little—*Kiri-kiri*.
 Love—*Veugumagi*.
 Man—*Auna*.
 Many—*Bóo-bóo*.
 Midday—*Aroola*.
 Moon—*Bue*.
 Much—*Kamu*.

Name (s.)—*Ara*.
 Night—*Póogi*.
 No—*Aikina, ai*.
 Noon—*Aroola*.
 North—*Walaka kavana*.
 Old—*Iraulaniai*.
 Old man—*Velepára*.
 Old woman—*Logeapara*.
 Outside—*Muliai*.
 Owl—*Elea*.
 Path—*Laopara*.
 Payment—*Voína*.
 Peace—*Maino*.
 Piece—*Kiaka*.
 Poison (s.)—*Kwarea mula*.
 Pray—*Mea mea*.
 Preach—*Wapáa*.
 Present, gift—*Beveniage auna*.
 Rain—*Kupa*.
 Read—*Alo-alo aia*.
 Remember—*Veugumagi*.
 Reply—*Vagele*.
 Right side—*Ripa kavana*.
 Road—*Laopara*.
 Sail—*La, kera*.
 Sea—*Lavapara*.
 Ship—*Lakaoi*.
 Sister, man's—*Wala-wala*.
 Sister, woman's—*Wala-wala*.
 Son—*Melo*.
 Soul—*Apuapu*.
 South—*Oreoa kavana*.

Steal—*Lema*.
 Stomach—*Inage*.
 Story, tale—*Kwalana*.
 Sun—*Aro*.
 Tell lies—*Ve wapáa*.
 Thief—*Lema pae auna*.
 To-day—*Oma*.
 To-morrow—*Rapaluga*.
 True—*Lorinai*.
 Village—*Vanuga*.
 War (s.)—*Vagi vagi, veali*.
 Water—*Nanu*.
 Wealth or property—*Au bóo bóo*.
 West—*Avalarigo kavana*.
 Wife, spouse—*Arawa*.
 World—*Anopara maguguluna*.
 Year—*Rigolo*.
 Yes—*Ina*.
 Yesterday—*Walani*.
 I—*Au*.
 Thou—*Oi*.
 He or she—*Ia*.
 We—*Ai, ia*.
 You—*Omi*.
 They—*Ila*.
 My—*Auego*.
 Thy—*Oigemú*.
 His—*Iagena*.
 Ours—*Aigema, lagera*.
 Yours—*Omigemi*.
 Theirs—*Ilageria*.

LEKU-LEKU.

(Ballad recounting noteworthy events in the history of a tribe.)

This particular portion is in a language which is not spoken in this neighbourhood, and is the oldest verses of the song known. It resembles the language spoken by the tribes inhabiting the south end of the McGillivray Ranges.

I.

Kita vetali vetalimina Wapuli Roga
kila vetali vetalimina.

Wapuli Roga is talking of fighting, is
 talking of fighting.

II.

Alepa melo gemi melina bua rigona
pakini roli pitagoana.

The Alepa men were coming armed.
 We drove them away.

III.

Kara gota revaluai leva tupuna.

Should we throw a spear, a man is hit.

LEKU-LEKU.

(From Kwaipo, in the McGillivray Ranges.)

*Oi babine aririgo taona tena oaririgo
aririgona. Leku, leku, &c.*

O you woman, softly walking, softly
creeping.

*Varaina gela malaga varaina variana
roka keto vegata. Leku, &c.*

O you man, you come from afar, and
fall on the path.

Oi babine tipi ono koro maina. Leku, &c.

O you woman, catch a quail with a
hand-net.

*Nege pune maoma kora verariana.
Leku, &c.*

O you girls, who are strong to catch a
pigeon.

*Nega vanuga nuganana origo auna rage
auna. Leku, &c.*

Inside the village, let us march up, let
us march down.

LEKU-LEKU.

(A later composition. Written in the tongue used in Kamali.)

*Olulaga oi buikima maniga pala popolona
epuruwai puru voinaleku-lekuve leku.*

O, Olulaga, your hair is thick and long
as the leaves of a "popolo."

*Olulaga oi gimamu kora legenâa negi
manega amo nana namo amo taliana.*

O Olulaga, when you shake your kora
(man-catcher) a heavy dew falls.

Olulaga irunaga dubu vili wai porâage.

O Olulaga, with the handsome face,
you hanged the head on the dubu
(sacrificial stage).

Oi tauna kone melo gili wana mo gitana.

Come, look at the boy from the bush
playing on the shore with a white
crane.

Oru manu naro gege lagi nama.

I am like a red parrot, I fly away and
return.

*Vanu ganani gera olo vanuganai ora
gena gipa manu noveni varâa varâana.*

There is a village on the summit of a
hill where men are taught wisdom by
an eagle-hawk.

*Gilalaka Iamolaka kila veagi veagimu
ma Molegolo ropina pana kepoleana.*

Gilalaka and Iamolaka, boasting who
of us is strong enough to overturn
the platform on Molegolo.

*Molegolo avalana lau minana minana
poro kulou melau minu vagi ana.*

When the north-west wind blows lightly
on Molegolo, your head-dress of
feathers will be displaced.

*Polo kulo kilamu lai nevaina oru aueku
noi nepinu pinuana.*

I do not want a head-dress. I will
bind twine around my ankles.

*Tinara ularana gena gemo kakona pe gau
rigo wagira Kalo vanuganai pelewa
kamu lavilavina.*

Our mother is at Kalo, where the sun
sets; let us be like the gemo (a fish)
and seek her out.

*Melo tariku mo rakâauta mo gurana mo
rakâauta ulanana mole konena mo tulu
tepa tepa na?*

My brother, what are you carrying;
and what are you doing in the water,
splashing it about with your feet?

VOCABULARY OF DIALECT SPOKEN BY NATIVES ON THE
SOUTH COAST OF BRITISH NEW GUINEA FROM DOMARA
TO MAIRU.

WORDS IN USE AT DOMARA WILL USUALLY BE UNDERSTOOD AT MAIRU,
AND VICE VERSÂ.

English.	Domara Dialect.	Mairu Dialect.
One	Ombua	Omupua.
Two	Awa	Ava.
Three	Aisheri	Aisei.
Four	Taurai	Sourai.
Five	Ima	Ima.
Six	Liliomo	Ririomu.
Seven	Liliawa	Ririava.
Eight	Liliaisheri	Ririaaiseri.
Nine	Liliataurai	Ririsourai.
Ten	Nanaom	Nanauomu.
Eleven	Liliomombua	Nanauomu omu.
Twelve	Awa	Nanauomu ava.
Twenty	Nana awa	Nanau ava.
Thirty	Nana aisheri	Nanau aiseri.
Forty	Nana tauai	Nanau sourai.
Fifty	Nana ima	Nanau ima.
Sixty	Nana lilioma	Nanau ririaomu.
Seventy	Nana liliawa	Nanau ririaava.
Eighty	Nana liliaisheri	Nanau ririaaise.
Ninety	Nana liliaitaurai	Nanau ririasourai.
One hundred	Nana gabana	Nanau gabanapua.
One hundred and two	Nana gabana ombua	Nanau gabanapua ava.
Two hundred . . . .	.....	Nanau ava.
One thousand . . . .	.....	Nanau omu.
Afternoon	Nina vataesi onaea	Nina vadaeke besa.
All	Teriade	Seriada usausa.
Anger	Vea	Vea.
Arrow	Kaupiseri	Vegarai (?).
Baby	Vagigiri	Oeva maramara.
Bad	Oreore	Oreore.
Beads	Bori	Bore.
Big	Okwi mugi	Ogota.
Blood	Nara, lala, <i>or</i> lara	Rara.
Bright	Ivivi	Ivivi.
Brother	Maramara	Napu.
Buy	Vaiaidema	Ga.
Chest	Beri	Sagasaga.
Chief	Ogoemegi	Ogoemegi.

English.	Domara Dialect.	Mairu Dialect.
Child	Maremegi . . . .	.....
Come	Aieni, ainoa	Aienine aiau.
Contract	Kora	Kora.
Cry	Ini . . . .	.....
Cup	Liusisi . . . .	.....
Dance	Bara	Bala.
Dark . . . .	.....	Galú.
Daughter	Torea	Torea.
Day	Nina	Nina.
Dead and Die	Bau	Bau.
Double	Ara ava	Rerei ava.
Drink	Sisi	Idi.
East	Bodea	Bose tiba aura.
Egg	Muru	Muruu.
Empty	Patiri . . . .	.....
Evening	Lavi	Lavi.
Face	Auraro	Idana.
False	Oa koikoi . . . .	.....
Family . . . .	.....	Aura.
Father	Abai . . . .	.....
Fish	Orebe	Orepe.
Food	Sisi	Idi idi.
Forenoon	Wau	Daba.
Friend	Nabu, daivegi . . . .	.....
Girl	Avita, torea	Torea.
Go	Babai . . . .	.....
Good	Enadeo, eboebo	Epoepo.
Great	Ogoda	Ogota.
Guest . . . .	.....	Taumana.
Hand	Ima	Ima paba.
He	Adegi . . . .	.....
Head	Moru	Moru.
Heart	Roruna, nua	Arame.
Heavens	Guba, nogara	Nogara.
House	Uru	Huru.
Husband	Ena avesa	Ena avesa.
Idiot	Oō	O emegi.
Ill	Marai	Marai.
Jehovah	Boi . . . .	.....
Island	Ragaru	Pomu.
Kill	Maia, mai mai	Maiau.
Kiss	Muti muti	Nani novo.
Know	Vegarai . . . .	.....
Land	One . . . .	.....
Language	Riba . . . .	.....
Life	Mauri	Mauri.
Light	Eu	Maeamaea.
Little	Girgiri, kinavoi	Ginovoi.
Midday	Nina asae	Nina adae.
Moon	Doveri, dowere	Tovere.

English.	Domara Dialect.	Mairu Dialect.
Morning	Nina aioi . . . . .	.....
Mother	Adei . . . . .	.....
Name	Maunua	Enomu.
Night	Garu . . . . .	.....
No	Kokoa, kokoi . . . . .	.....
Noon	Nina asai	Nina adae.
Nose	Duruma	Noga.
Obey	Nanaia . . . . .	.....
Old . . . . .	.....	Poaete, poae ataei.
Paddle	Reva	Leva (v.), teitaati.
Path	Laea	Laea.
Peace	Biga	Piga.
Plenty	Teriade . . . . .	.....
Present, gift	Minioni	Veveni ona.
Quick	Vevauna . . . . .	.....
Rain	Guba	Bailo.
Reply	Ho	Ho.
Right side	Iata aura	Iada aura.
Rob	Vedati	Vetutitaati.
Round	Taro kikirota . . . . .	.....
Sail	Laiiai <i>or</i> ororaia	Laea epa.
Salt	Tari	Damena.
Sea	Loa	Loa.
Ship	Orou	Orou.
Sister	Nabu	Napu.
Small	Oviatu . . . . .	.....
Son	Abei	Oeva.
Soul . . . . .	.....	Iau.
South	Eorobo	Gabina aura.
Stomach	Beni, boona	Dinae.
Sun	Nina	Nina.
Tall	Laugona	Raurata.
To-day . . . . .	.....	Eva eva.
To-morrow	Isou	Itou.
Tree	Ana	Ana.
True	Iboiboi, egenae	Ekena.
Upwards . . . . .	.....	Ini.
Village	Mari	Mari.
War . . . . .	.....	Maimai.
Water	Ama	Aama.
West	Avara	Gabina aura.
White men	Hauda	Emegi goeagoea.
Wife	Aueta	Ena avesa.
Woman	Ause, aveta	Avesa.
Yes	Kotu, gara	E.
Yesterday	Ilova	Ilovo.
I	Ia, vinegi (?)	Ia.
Thou	Ga, denegi	Ga.
He <i>or</i> she	Adege	Ateg.

English.	Domara Dialect.	Mairu Dialect.
We	Gea	Kea.
We two	Enicheri . . . . .	.....
We (of a great number)	Adei . . . . .	.....
You	Gana, ivegi (?)	Aea.
They	Utogoda	Oma.
My	Vinega	Iaina.
Thy	Denegi	Gana.
His	Oiegi enoibaa	Ategi ena.
Ours	Kekena	Kekena omana.
Yours	Aea ana	Aea ana.
Theirs	Omana	Omana.

ABORIGINAL VOCABULARY OF THE DABU TRIBE.

TABLE SHOWING CERTAIN PRINCIPAL WORDS, &c., USED BY ABORIGINALS OF THE DABU TRIBE, AND MORE OR LESS UNDERSTOOD BY OTHER TRIBES BETWEEN MOWATTA AND THE MAI KUSSA, ON THE COAST OF BRITISH NEW GUINEA.

(Some words have been taken from the neighbouring Toga tribe when the two dialects differ.)

One—*Tupidibi*.

Two—*Kumirivi*.

Three—*Kumireriga*.

Four—*Kumirivi kumirivi*.

Five—*Tumu*.

[They try to manufacture compound words to represent large numbers, but they really count only up to five.]

Afternoon—*Aipunan*.

Alien (foreigner)—*Wiagalla*.

Answer—*Napena*.

Arrow—*Tabora*.

Ask—*Mulagan*.

Baby—*Kasiramu*.

Bad—*Gagir, gagirakun*.

Beads—*Kusa* (same as Saibai).

Big—*Rate*.

Boat—*Gara*.

Blood—*Mem, mam*.

Body—*Pol*.

Boy—*Rugi, zezag*.

Bright—*Nutimi*.

Brother (man's elder)—*Amil-ne-kapa, mochen*.

Brother (man's younger)—*Muina mul, munyen*.

Brother (woman's)—*Maun*.

Buy—*Tupribibin, or bundrugmina*.

Canoe—*Gar*.

Chief—*Ghaga, musing-rabi, mitang*.

Child—*Rugukad, kasalrami-rug*.

Cold—*Kakir*.

Come—*Wia*.

Cry—*Gnone*.

Daughter—*Munkute*.

Day—*Yabada*.

Dead and Die—*Kududar, kuduru*.

Demon—*Kabor*.

Drink—*Ine-debone, ine-noni*.

Eat— <i>Noto, uatota.</i>	Midday— <i>Yaba tu kamedā.</i>
Egg— <i>Kap.</i>	Moon— <i>Quar, quak.</i>
Enemy— <i>Kut.</i>	Morning— <i>Bobodanu.</i>
Evening— <i>Totoye, yaboda-akonau.</i>	Mother— <i>Yai.</i>
Face— <i>Ikap.</i>	Much— <i>Tomaibi.</i>
Family— <i>Numkungin.</i>	Name (s.)— <i>Bin, bina.</i>
Father— <i>Baba.</i>	Night— <i>Kuteme.</i>
Feast— <i>Tarirate, rabu-wototo-uduagday.</i>	No— <i>Indan, bagin, dunai.</i>
Fire— <i>Yu, dumbrel.</i>	Noon— <i>Yaba tu kamedā.</i>
Fish— <i>Pudi.</i>	North— <i>Kumag.</i>
Forenoon— <i>Yabadanadir.</i>	Old— <i>Natangat.</i>
Friend— <i>Tabad, nungo rabu.</i>	Payment— <i>Mue.</i>
Ghost— <i>Anike.</i>	Peace— <i>Piuda, goigi-bajin.</i>
Girl— <i>Mukute, katarama.</i>	Pig— <i>Mule, chimela, sasa, simara.</i>
Give— <i>Anai iminiga.</i>	Present (gift)— <i>Yuga be namingal.</i>
Go— <i>Naibe, ibi.</i>	Rain— <i>Igurai punyin.</i>
God— <i>Augad.</i>	Reply— <i>Nape nape.</i>
Good— <i>Amul, amöl.</i>	Right side— <i>Atomparegin.</i>
Great— <i>Rati.</i>	Road— <i>Nyungu.</i>
Guest— <i>Toboda.</i>	Run— <i>Putukupi, wujiji.</i>
Gun— <i>Bagal, bugala.</i>	Sail— <i>Garapun.</i>
Hand— <i>Tangkor.</i>	Sea— <i>Bäu.</i>
Hand (left)— <i>Torto.</i>	Ship— <i>Bota.</i>
Heart— <i>Tikopa, chichirinan.</i>	Sister (man's)— <i>Maun.</i>
Heavens— <i>Utalī.</i>	Son— <i>Rug.</i>
House— <i>Ma.</i>	Soul— <i>Aunke.</i>
Husband (spouse)— <i>Gnumua.</i>	South— <i>Keteropu.</i>
Ill— <i>Pultadibidi.</i>	Steal— <i>Gaumar.</i>
Inland— <i>Utalī.</i>	Sun— <i>Iabada, yabada.</i>
Interpret— <i>Tungmami.</i>	Tall— <i>Ikrechajag.</i>
Island— <i>Umirandi.</i>	To-day— <i>Kanabag.</i>
Jaw (lower)— <i>Tebu.</i>	To-morrow— <i>Jangwi.</i>
Joint— <i>Aklimuni.</i>	True— <i>Imamul.</i>
Kill— <i>Nabodă.</i>	Twilight— <i>Osiunang.</i>
Kiss— <i>Makachisamar.</i>	Village— <i>Aworra, magida ma.</i>
Knife— <i>Kuwere, turikata.</i>	War (s.)— <i>Goija-angidan.</i>
Language— <i>Yeke.</i>	Water— <i>Ine.</i>
Large— <i>Rate.</i>	West— <i>Aapunan.</i>
Laugh— <i>Tongoi.</i>	White men— <i>Kaber.</i>
Leg— <i>Tule.</i>	Wife, spouse— <i>Mura, gumuumara.</i>
Life— <i>Tupako ipiliga.</i>	Woman— <i>Mure.</i>
Light (s.)— <i>Kudenenagre, naude.</i>	World— <i>Ikopiragan.</i>
Long— <i>Tupiamul.</i>	Year— <i>Tongupeje.</i>
Man— <i>Rabu.</i>	Yes— <i>Ao.</i>
Many— <i>Yuag.</i>	Yesterday— <i>Jangoi.</i>

I—*Ngana, gna, una.*
 Thou—*Bungu, bungo.*
 You and I—*Bungugnaainer.*
 He or she—*Bwainen.*
 We—*Ngami, gagi maulidag.*
 You—*Bibi, bibidagwe.*

They—*Ubidag, dedonengdan.*
 My—*Umudan.*
 Thy—*Ubudan.*
 His—*Ubudan.*
 Ours (exclusive and inclusive)—
Binedagwe.

ABORIGINAL VOCABULARY OF NADA (LAUGHLAN ISLANDS).

1. In this dialect a large proportion of words end in a vowel so short that it is often difficult to recognise its presence, and very frequently impossible to determine accurately what the vowel really is, as different natives use different terminal vowels for the same word when they are made to pronounce it slowly. In many words within the final vowel is omitted, if it really exists, as it could not be pronounced by a stranger without, to a large extent, disguising the word. Words will therefore frequently be met with ending in a consonant. It seems to be as correct to write "anad" (village) as to write it "anada;" "mān" (bird) is as correct as "mānũ."

2. The dialect presents a sound which probably cannot be written in our alphabet. It seems to be used instead of *d* or *g* in some of the neighbouring languages: for example, the "keza" (road) of Nada is the "keda" of Sariba; the "zizaga" (toes) of Nada is the "gigina" of Sariba. The proper sound is not that of our *z*, but more like *zh* or *zsh*.

3. The Nada people have no difficulty whatever in pronouncing two consonants without any intervening vowel sound. A feature of the language is the frequent occurrence of *w* after *g*, *k*, *p*, *b*, *k* after *m*, and of *l* after *g*. "Igwela," feeble; "aukweda," door; "aropwis," basket; "busibwasi," cocoa-nut; "umka," mist; "vagla," oar.

4. The Polynesian element is not on the whole so strong in this language as might from the geographical position of the group have been expected. As Nada is only some two-score of miles from Murua, it is naturally closely related in language to that island; indeed, they possess many words that are common to the two. The following words may, however, be considered to be current Polynesian:—

One—*Atanok.*
 Two—*Akwaiu.*
 Three—*Akwaitola.*
 Four—*Akwailas.*
 Five—*Akwailima.*

Ten—*Asiratāna.*
 Twenty—*Asirawaiu.*
 Thirty—*Asiratola.*
 Forty—*Asiralas.*
 Fifty—*Asiralima.*

These are all the numbers they have.

<i>Nima</i> —hand. In Nada the form “lima” presents itself in “akwail-ima,” five.	<i>Waga</i> —canoe.
<i>Sinana</i> —mother.	<i>Vana</i> —chloasma.
<i>Manu</i> —bird.	<i>Niu</i> —cocoa-nut.
<i>Beba</i> —butterfly.	<i>Teuia</i> —conch-shell.
<i>Tamana</i> —father.	<i>Imata</i> —dead.
<i>Anad</i> —village, land.	<i>Matana</i> —eye.
<i>Kutu</i> —louse.	<i>Kuva</i> —yam.
<i>Taurarak</i> —great chief.	<i>Papatutu</i> —be wet.
<i>Babalau</i> —long.	<i>Iua</i> —fruit.
<i>Weu</i> —sting, liar.	<i>Kinura</i> —saliva.
<i>Kitoku</i> —walking-stick.	<i>Lela</i> —paddle.
	<i>Tabuna</i> —ancestors.
	<i>Ilan</i> —walk.

5. The Nada language is a combination of poverty and riches. It has, for example, the word “igiba” for bad and enemy, “guiao” for chief, generous, rich, and property-holder; “anad” means both land and village. On the other hand, it has names for the different fingers; for cocoa-nuts at different stages of growth. It possesses convenient forms for counting and indicating the days up to five forwards and backwards, and for expressing two — five of us, &c.

6. The grammar is of very considerable interest. The extraordinary flexibility of the possessive pronouns, and the singularly rich and, it may be said, beautiful inflections and combinations of the verb, render this language, which would otherwise, on account of its arrangement of the consonants, be rough and harsh, almost euphonious.

7. A comparison of the Nada language with that of Kiwai, one of the most westerly tongues of the Possession committed to writing, is of great interest. It would probably not be easy to find two languages that have less in common. The word “mere” (child) of Kiwa is the “mera” of Nada. There are two other words that may have an etymological relationship—the “urio” (demon) of Kiwai may be connected with the “aruo” of Nada, and the “topo obo” (fresh water) of Kiwai may have some affinity with the “sopu” of Nada. But as the two languages do not seem to touch at other points, these may be merely coincidences.

In grammar they are also essentially different.—W. M.

Afternoon— <i>Yanadi</i> .	(When a brother speaks)—
Alien (foreigner)— <i>Gumanumu</i> .	Brother, my elder— <i>Bodagu</i> .
Arrow— <i>Noguna</i> .	Brother, my younger— <i>Tauwagu</i> .
Axe— <i>Tarara</i> .	Sister, my elder— <i>Leugu namola</i> .
Baby— <i>Kwapwao</i> .	Sister, my younger— <i>Leugu iin kiketa</i> .
Bad— <i>Igiba</i> .	(When a sister speaks)—
Beautiful— <i>Karamaia</i> .	Brother, my elder— <i>Leugu</i> .
Blood— <i>Buiāi</i> .	Brother, my younger— <i>Leugu</i> .
Bread— <i>Ikuika</i> .	Sister, my elder— <i>Bodagu</i> .
Breath— <i>Kauyai</i> .	Sister, my younger— <i>Tauwagu</i> .

- Buy—*Gimaru*.
 Call—*Kularo*.
 Canoe—*Waga*.
 Chief (means property-owner)—*Guiáo*.
 Child—*Mera*.
 Cold—*Mizhisa*.
 Come—*Kumu, panena*.
 Dance—*Isara, kaiwosa*.
 Dark—*Ideduba*.
 Daughter, my—*Itugu*.
 Day (sun rises or sun risen)—*Tararaga silasila*.
 Day after to-morrow—*Butola*.
 Dead—*Imata*.
 Demon—*Nibogawa, aru*.
 Drink—*Usopu*.
 East (the rising of the sun)—*Tararag sila sila*.
 Eat—*Agad*.
 Enemy (bad man)—*Igiba tau* (no other word for enemy).
 Evening—*Yanadi*.
 Family—*Teraksa*.
 Farewell—*Tenemo*.
 Fear—*Anpalata*.
 Feast—*Pākā, mǎnán*.
 Fingers (also means toes)—*Ziziga*.
 Thumb—*Zizilagu*.
 Index finger—*Skata*.
 Mid-finger—*Kadoai*.
 Ring-finger—*Mareresi*.
 Little finger—*Skukiu*.
 Fire—*Gidagu*.
 Fish—*Mōta*.
 Food—*Anu*.
 Forenoon—*Madeduga*.
 Friend—*Munasona*.
 Ghost—*A'ráo*.
 Girl—*Iin kikita*.
 Good—*Karamaia*.
 God—*Mumuroba*.
 Go—*Kulan*.
 Good-bye—*Tenémo*.
 Great—*Katuwai*.
 Guest (seems rather a person invited to work a passage)—*Gusageru*.
 Hand (also includes arm)—*Nimagu*.
 Head—*Igena*.
 Heart—*Nopuuna*.
 Heavens—*Karbimeta*.
 House—*Koba*.
 Husband—*Dagona*.
 Ill—*Katona*.
 Inland—*Kasbalao*.
 Iron—*Aramunum*.
 Island—*Anada kikita*.
 Joint—*Kiraponi magu*.
 Kiss (by smelling)—*Kwiubosuna, taleru*.
 Land—*Anad*.
 Left side—*Kikimau, obamatu*; to the left in steering, *boruka*.
 Life—*Imōia*.
 Light (n.)—*Sapangidagu*.
 Little—*Kikita*.
 Man—*Tau*; old man, *tomula*.
 Mamma (my)—*Matana sesegu*.
 Many—*Kabuba*.
 Marriage—*Ikaruna*.
 Midday—*Lanai*.
 Moon—*Waikena*.
 Month—*Waikena* (*vide* year).
 Mother—*Sinana*.
 Much—*Kabuba*.
 Name—*Larana*.
 Night—*Deduba*.
 No—*Gewam'*.
 Noon—*Lanai*.
 North—*Bomata*.
 Old (generally)—*Pamugu*.
 Palm—*Nuana nimagu*.
 Path—*Keza*.
 Peace—*Silutútaú*.
 Plenty—*Kabuba*.
 Poor—*Toru*.
 Present (gift)—*Atelōia*.
 Rain—*Kwes*.
 Rest—*Alawás*.
 Right side—*Walui*; to right side in steering, *yawatena*.
 River—*Rai*.
 Sail—*Lala*.
 Sea—*Lora*.

Ship— <i>Waga katuwai</i> .	True— <i>Munita</i> .
Sick— <i>Katou</i> .	Twilight— <i>Yanadr</i> .
Sister— <i>See</i> under Brother.	Uncle (maternal)— <i>Gudiana</i> .
Sleep— <i>Kwzeru</i> .	Village— <i>Anada</i> .
Son— <i>Intuna</i> .	Virgin— <i>Mian mera</i> .
Soul— <i>Aruo</i> .	Venomous— <i>Sibgweu</i> .
South— <i>Yarsa</i> .	War— <i>Abina</i> .
Star— <i>Utuna</i> .	Warm— <i>Muya muya</i> .
Sun— <i>Silasila</i> .	Water— <i>Sopu</i> .
Tall— <i>Babalau</i> .	Wealth— <i>Kabubu wekwis</i> .
Think— <i>Miana lakona</i> .	West (in reference to wind)— <i>Laata</i> .
To-day— <i>Etu</i> .	West (going down of sun)— <i>Zerira sila-sila</i> .
To-morrow— <i>Buriga</i> .	White men— <i>Guminumu</i> .
Day after to-morrow— <i>Butola</i> .	Wife— <i>Dagogu</i> .
The fourth day— <i>Bulas</i> .	Wind $\left\{ \begin{array}{l} \text{north-east} \\ \text{south-east} \\ \text{east} \end{array} \right\}$ <i>Nuvita</i> .
The fifth day— <i>Bulim'</i> .	Wind (north)— <i>Bomata</i> .
Toes— <i>Ziziga</i> .	Wind (south)— <i>Yarsa</i> .
Great toe— <i>Zizilagu</i> .	Wind (west or north-west)— <i>Laata</i> .
Second toe— <i>Skata</i> .	Woman— <i>Iinā</i> .
Third toe— <i>Kadoai</i> .	World— <i>Arauini anada</i> .
Fourth toe— <i>Mareris</i> .	
Little toe— <i>Skukiu</i> .	
Treaty— <i>Kotolun</i> .	

Month, lunar—*Waikena* (a moon).

		HOW SPENT—	
Year— <i>Tatou</i> .	Lavaata or <i>Lāta</i> — Westerly winds.	November— <i>Dilavata</i>	Go to Murua Island.
		? — <i>Lotakuna</i>	In Murua and returning.
		? — <i>Levitamu</i>	In Nada.
		? — <i>Kisura</i>	Go to Murua.
		March— <i>Gensa</i>	Return to Nada.
	<i>Nuvita</i> — Easterly winds.	April— <i>Lerus</i>	Remain at home and work at copra-making.
		? — <i>Atutara</i>	
		? — <i>Anamatona</i>	
		? — <i>Zhim</i>	
		October— <i>Mira mara</i>	

The Lavaata stars are *Gumitar* (Pleiades) and *Kiaza* (Orion). They are their compass stars for travelling to and from Murua.

Yes— <i>Ia, ēē</i> .	He or she— <i>Tona</i> .
Yesterday— <i>Nagōu</i> .	We— <i>Toda</i> .
	We two— <i>Aditeiyo</i> .
I— <i>Togu</i> .	We three— <i>Aditeitolu</i> .
Thou— <i>Tom'</i> .	We four— <i>Aditeivas</i> .

We five—*Aditeinim*.
 You—*Tumis*.
 They—*Tosi*.
 My—*Tōgu*.
 Thy—*Tōmu*.
 His—*Etōna*.

Ours—*Tomaia*.
 Yours—*Tomis*.
 Theirs—*Tosa*.
 Each—*Kwoitara*.
 Who—*Barara*.
 What—*Tanan*.

ABORIGINAL VOCABULARY OF NALA.

TABLE SHOWING CERTAIN PRINCIPAL WORDS, &C., USED BY ABORIGINES OF
 NALA COAST TRIBE, CENTRAL DISTRICT, BRITISH NEW GUINEA.

One— <i>Kaonamo</i> .	Beautiful— <i>Nama vaike</i> .
Two— <i>Lua</i> .	Blood— <i>Lala</i> .
Three— <i>Koi</i> .	Body— <i>Gau</i> .
Four— <i>Vani</i> .	Brain— <i>Ilou</i> .
Five— <i>Ima</i> .	Bright— <i>Viloa</i> .
Six— <i>Kalakoi</i> .	Brother— <i>Lovua</i> .
Seven— <i>Kalakoi ka</i> .	Brother, elder— <i>A'ana</i> .
Eight— <i>Kalavani</i> .	Brother, younger— <i>Kadiu</i> .
Nine— <i>Kalavani ka</i> .	Buy— <i>Taratara</i> .
Ten— <i>Oūka</i> .	Canoe— <i>Asi</i> .
Eleven— <i>Ouka ka</i> .	Chief— <i>Lovia</i> .
Twelve— <i>Ouka lua</i> .	Child— <i>Nakuna</i> .
Twenty— <i>Lua na vui</i> .	Come— <i>Mai</i> .
Thirty— <i>Koi na vui</i> .	Dance— <i>Neva</i> .
Forty— <i>Vani na vui</i> .	Daughter— <i>Varato</i> .
Fifty— <i>Ima na vui</i> .	Day— <i>Melala</i> .
Sixty— <i>Kalakoi na vui</i> .	Dead— <i>Eba</i> .
Seventy— <i>Kalakoika na vui</i> .	Demon— <i>Oada</i> .
Eighty— <i>Kalavani na vui</i> .	Devil— <i>Tiaboro</i> .
Ninety— <i>Kalavanika na vui</i> .	Do— <i>Kalala, evavaia</i> .
One hundred— <i>Sināvu ka</i> .	Double— <i>Elelua</i> .
One hundred and two— <i>Sinavuka lua</i> .	Drink— <i>Inua</i> .
Two hundred— <i>Sinavu lua</i> .	East— <i>Vale</i> .
One thousand— <i>Sinavu ouka (?)</i> .	Eat— <i>Ania</i> .
Afternoon— <i>Ravakeni</i> .	Egg— <i>Akoi</i> .
Alien (foreigner)— <i>Nao</i> .	Enemy— <i>Oū</i> .
All— <i>Bounai</i> .	Evening— <i>Lavilavi</i> .
Answer— <i>Davasi oluluva (?)</i> .	Face— <i>Vailana</i> .
Arrow— <i>Siba</i> .	Family— <i>Idubu</i> .
Baby— <i>Nakuna omaoma</i> .	Farewell— <i>Bamuinai</i> .
Bad— <i>Siavana</i> .	Finger— <i>Olu</i> .
	Finger, index— <i>Olu boatana</i> .

Finger, little—*Olu kekena*.
 Finger, middle—*Olu olu*.
 Finger, ring—*Olu olu*.
 Finger, thumb—*Olu batana*.
 Fire—*Alora*.
 Food—*Aniani* and *bokama*.
 Forenoon—*Melala eleau*.
 Friend—*Enakau*.
 Ghost—*Oada*.
 Girl—*Vavato*.
 God—*Dilava*.
 Good—*Mama'ana*, *namaina*.
 Great—*Namana*.
 Guest—*Dona*.
 Gun—*Ipidi*.
 Heavens—*Vutuvutu*.
 House—*Luma*.
 Husband—*Adana*.
 Ill—*Olele*.
 Island—*Keli ivua*.
 Kill—*Akua*.
 Kiss—*Lava*.
 Knife—*Moila*.
 Left side—*Eale'u*.
 Life—*Mauli*.
 Light—*Ailala*.
 Little—*Iuiuna*.
 Man—*Kau*.
 Many—*Routamu*.
 Midday—*Adoa rapu*.
 Moon—*Bula*.
 Name—*Vana*.
 Night—*Boni*.
 No—*Asi'i*.
 Noon—*Adoarapu*.
 Ocean—*Rema*.
 Path—*Dala*.
 Peace—*Maino*.
 Poison (s.)—*Baaukubuna*.
 Reply—*Aomu* (?).
 Right side—*Idibaduasi*.
 Rob—*Tasia*.
 Sea—*Atu*.
 Ship—*Aunakoi*.

Sister, man's—*Lobuna*.
 Sister, woman's elder—*A'ana*.
 Sister, woman's younger—*Kadina*.
 Son—*Melo*.
 Son-in-law—*Lava*.
 Soul—*Idumena*.
 South—*Sivo avekena*.
 South-east—*Vale avekena*.
 Sun—*Melala*.
 Sunrise—*Melala ereau*.
 To-day—*Valiu*.
 To-morrow—*Avu avu*.
 Treaty—*Luva*.
 Tree—*Au*.
 Twilight—*Ailala*.
 Upwards—*Akai*.
 Village—*Vanua*.
 War—*Akuaku*.
 Water—*Vei*.
 Wealth or property—*Kohu*.
 West—*Levo*.
 White men—*Kau Devaana*.
 Wife—*Adana*.
 Woman—*Aate*.
 World—*Kanobada ipounai* (?).
 Year—*Vikau*.
 Yes—*Onieva*.
 Yesterday—*Lavi*.

I—*Lau*.
 Thou—*Oni*.
 He or she—*Ia*.
 We (exclusive)—*Lai*.
 We (inclusive)—*Ita*.
 You—*Oi*.
 They—*Ia*.
 My—*Laueu*.
 Thy—*Oniemu*.
 His—*Iaena*.
 Ours—*Lai emai, ita eta*.
 Yours—*Oi emui*.
 Theirs—*Ia eta*.
 Each—*Ka-ka*.

ABORIGINAL VOCABULARY OF SINAUGOLO.

TABLE SHOWING CERTAIN PRINCIPAL WORDS, &c., USED BY ABORIGINES OF SINAUGOLO, CENTRAL DISTRICT, BRITISH NEW GUINEA, AND SPOKEN BY SAROA, RIGO, BABAKA, BONO, KEMAIA, WABURAVA, SAROKAB, GUMIRIDOBEL, AND GAMATA.

One— <i>Sebona</i> .	Brother, man's elder— <i>Kakana</i> .
Two— <i>Lualua</i> .	Brother, man's younger— <i>Talina</i> .
Three— <i>Toitoi</i> .	Brother, woman's— <i>Tobana</i> .
Four— <i>Vasivasi</i> .	Brown— <i>Dubaduba</i> .
Five— <i>Imaima</i> .	Buy— <i>Voivoi</i> .
Six— <i>Imaima sebona</i> .	Canoe— <i>Gasi</i> .
Seven— <i>Imaima lualua</i> .	Chief— <i>Veligauka</i> .
Eight— <i>Imaima toitoi</i> .	Child— <i>Natuna</i> .
Nine— <i>Imaima vasivasi</i> .	Come— <i>Novagoma</i> .
Ten— <i>Gabanana</i> .	Contract (s.)— <i>Roa</i> .
Eleven— <i>Gabanana sebona</i> .	Daughter— <i>Guiato</i> .
Twelve— <i>Gabanana lualua</i> .	Day— <i>Galo</i> .
Twenty— <i>Gabana lualua</i> .	Dead— <i>Bemase</i> .
Thirty— <i>Gabana toitoi</i> .	Deaf— <i>Seaga pore</i> .
Forty— <i>Gabana vasivasi</i> .	Demon— <i>Golaka</i> .
Fifty— <i>Gabana imaima</i> .	Do— <i>Nuveia</i> .
Sixty— <i>Gabana imaima gabanana</i> .	Double— <i>Gerelua</i> .
Seventy— <i>Gabana imaima gabana lualua</i> .	Eat— <i>Noaganina</i> .
Eighty— <i>Gabana imaima gabana toitoi</i> .	Egg— <i>Gatoi dakarana</i> .
Ninety— <i>Gabana imaima gabana vasivasi</i> .	Enemy— <i>Vetari</i> .
One hundred— <i>Sinaona</i> .	Evening— <i>Lavilavi</i> .
One hundred and two— <i>Sinaonalua</i> .	Face— <i>Goila</i> .
Two hundred— <i>Sinau lualua</i> .	Falsehood— <i>Gegu dirini</i> .
One thousand— <i>Dagalana</i> .	Family— <i>Karava</i> .
	Farewell— <i>Maniotanuni</i> .
Afternoon— <i>Galo bevanagi</i> .	Feast— <i>Veleko</i> .
Alien (foreigner)— <i>Nao</i> .	Fight— <i>Bevagi</i> .
All— <i>Mabarana</i> .	Fire— <i>Kalava</i> .
Arrow— <i>Diba</i> .	Fish— <i>Magani</i> .
Baby— <i>Meromisina</i> .	Food— <i>Ganigani</i> .
Beautiful— <i>Namona sebona</i> .	Forenoon— <i>Bogibogi</i> .
Big— <i>Bala</i> .	Friend— <i>Gatana</i> .
Big, very— <i>Dagalabala</i> .	Ghost— <i>Golaka</i> .
Boy— <i>Mero</i> .	Girl— <i>Guiato</i> .
Bright— <i>Kana kana</i> .	God— <i>Barau</i> .
	Good— <i>Namo</i> .
	Great— <i>Dagalabala</i> .

Guest— <i>Narika</i> .	Sister, woman's— <i>Kakana, tarina</i> .
Gun— <i>Pedi</i> .	Son— <i>Mero</i> .
Head— <i>Deba</i> .	Son-in-law— <i>Tagama</i> .
Heart— <i>Lolo</i> .	Soul— <i>Iauka</i> .
Heavens— <i>Guba</i> .	South-east— <i>Buibada</i> .
House— <i>Numa</i> .	Sun— <i>Galo</i> .
Husband, spouse— <i>Alagona</i> .	Thank you (for tobacco only)— <i>Tauna maiga</i> .
Ill— <i>Kevi</i> .	To-day— <i>Toma</i> .
Island— <i>Dagaru bara</i> .	To-morrow— <i>Boinani</i> .
Joint— <i>Iogui oguna</i> .	Treaty— <i>Roa</i> .
Kill— <i>Novagia</i> .	True— <i>Mogoni</i> .
Kiss— <i>Novilaua</i> .	Twilight— <i>Galo bebolea</i> .
Laugh— <i>Riki</i> .	Village— <i>Vanuga</i> .
Left side— <i>Kauri</i> .	War (s.)— <i>Vagivagi</i> .
Life— <i>Maguri</i> .	Wealth or property— <i>Kou</i> .
Light (s.)— <i>Mama</i> .	White men— <i>Taukurokuro</i> .
Little— <i>Misina, keina</i> .	Wife, spouse— <i>Alagona</i> .
Man— <i>Tau</i> .	World— <i>Tanobaramabarana</i> .
Many— <i>Momo, gutuma</i> .	Year— <i>Guitau</i> .
Moon— <i>Guve</i> .	Yes— <i>Oi, aba</i> .
Mouth— <i>Boka</i> .	Yesterday— <i>Golagani</i> .
Name (s.)— <i>Arana</i> .	
Night— <i>Bogi</i> .	I— <i>Au</i> .
No— <i>Asigina</i> .	Thou— <i>Goi</i> .
Noon— <i>Galogota</i> .	He or she— <i>Gia</i> .
Path— <i>Dabara</i> .	We— <i>Gai, ita</i> .
Payment— <i>Voina</i> .	You— <i>Gomi</i> .
Peace— <i>Maino</i> .	They— <i>Gia</i> .
Poison (s.)— <i>Mase mulaga</i> .	My— <i>Augegu</i> .
Present, gift— <i>Aunagemu</i> .	Thy— <i>Goigemu</i> .
Rain— <i>Gula</i> .	His— <i>Iagena</i> .
Reply— <i>Nogogo lagi</i> .	Ours— <i>Gaigema, itagera</i> .
River— <i>Wai</i> .	Yours— <i>Gomi gemi</i> .
Sea— <i>Dama</i> .	Theirs— <i>Iageri</i> .
Shield— <i>Gesi</i> .	Each— <i>Ta ta</i> .
Ship— <i>Yagatoi</i> .	
Sister, man's— <i>Tobana</i> .	

ABORIGINAL VOCABULARY OF TOARIPI.

TABLE SHOWING CERTAIN PRINCIPAL WORDS, &c., USED BY ABORIGINALS OF TOARIPI, AND SPOKEN IN THE EASTERN END OF THE GULF OF PAPUA.

One— <i>Falaheka</i> .	Three— <i>Roisorio</i> .
Two— <i>Oraokoria</i> .	Four— <i>Oráoko ráoko</i> .

- Five—*Befäläheka*.
 Six—*Raoka raoko raoko*.
 Seven—*Raoko raoko raoko beflakeka*.
 &c., &c., &c.
- Afternoon—*Sarī sukopa*.
 Alien (foreigner)—*Nao*.
 All—*Nauapu*.
 Answer—*Owapaie*.
 Arrow—*Farisa*.
 Baby—*Mere beseka*.
 Bad—*Bairoro*.
 Beautiful—*Nareva*.
 Big—*Luvaia*.
 Breath—*Biruru*.
 Bright—*Aūri*.
 Brother, woman's—*Wārūa*.
 Brother, man's elder—*Pāu*.
 Brother, man's younger—*Murrehari*.
 Bury—*Biopaia*.
 Buy—*Teraitia*.
 Canoe—*Roti*.
 Chief—*Bugari*.
 Child—*Tute*.
 Come—*Kotiria*.
 Contract (s.)—*Karuoreari*.
 Cup—*Miriki*.
 Dance—*Iōia*.
 Daughter—*M* or *boreseka*.
 Day—*Sari*.
 Dead—*Opāi*.
 East—*Rako rutai, bautamaruru*.
 Enemy—*Idi*.
 Evening—*Faitaburu*.
 Falsehood—*Apevā*.
 Family—*Elav api vita*.
 Famine—*Posera*.
 Farewell—*Saio*.
 Feast—*Soka*.
 Fire—*Ahari*.
 Forenoon—*Beopai*.
 Friend—*Pavura*.
 Girl—*Mari*.
 God—*Karisu*.
 Good—*Ivaleva*.
 Great—*Beai*.
- Guest—*Pawari hari uviava*.
 Hand, right—*Mai toare*.
 House—*Uvi*.
 Husband (spouse)—*Ua*.
 Ill—*Mea eka*.
 Island—*Firu*.
 Kill—*Paiai, toa apaia*.
 Kiss—*Verasisia*.
 Land—*Bea*.
 Left side—*Mai aba*.
 Life—*Makuri*.
 Light (s.)—*Obaba*.
 Little—*Oroti*.
 Man—*Karu*.
 Many—*Lauapu*.
 Midday—*Sare rorivua*.
 Night—*Faita vulu*.
 No—*Akáo*.
 Noon—*Sare rorivua*.
 North—*Maruru*.
 North-west—*Avara*.
 Payment—*Arikaruvia*.
 Peace—*Tairu*.
 Present (gift)—*Lohiavita*.
 Rain—*Nai*.
 Reply—*Ovapaia*.
 Sea—*Makai kara*.
 Ship—*Vavaea*.
 Sister (man's)—*Uaroa*.
 Sister (woman's)—*Paua, maraheari*.
 Son—*Tuti*.
 Son-in-law—*Ava*.
 Soul—*Meaovi*.
 South—*Dede*.
 South-east—*Bauta*.
 Star—*Koru*.
 Sun—*Sare*.
 Tall—*Sabori*.
 To-day—*Faitara*.
 To-morrow—*Bebere*.
 Treaty—*Ooriave*.
 Tree—*Tora*.
 Twilight—*Sare sukopi velaloi*.
 Upwards—*Beasovarautōi* (?), *patái*.
 Village—*Karikara*.
 Warrior—*Maorovita*.

Wealth or property—*Roasi*.

West—*Navautai*, *avara rere*.

White men—*Maea seia*.

Wife (spouse)—*Ua*.

Woman—*Ua*.

World—*Mea noaia*.

Year—*Biabia*.

Yes—*Leha*.

Yesterday—*Veveri*.

I—*Aráo alao*.

Thou—*A'o (aita ?) aleha*.

He or she—*Arcveu areatareha*.

We—*Erao ereita*.

You—*Eo*.

They—*Eveo*.

My—*Alave*.

Thy—*Avi*.

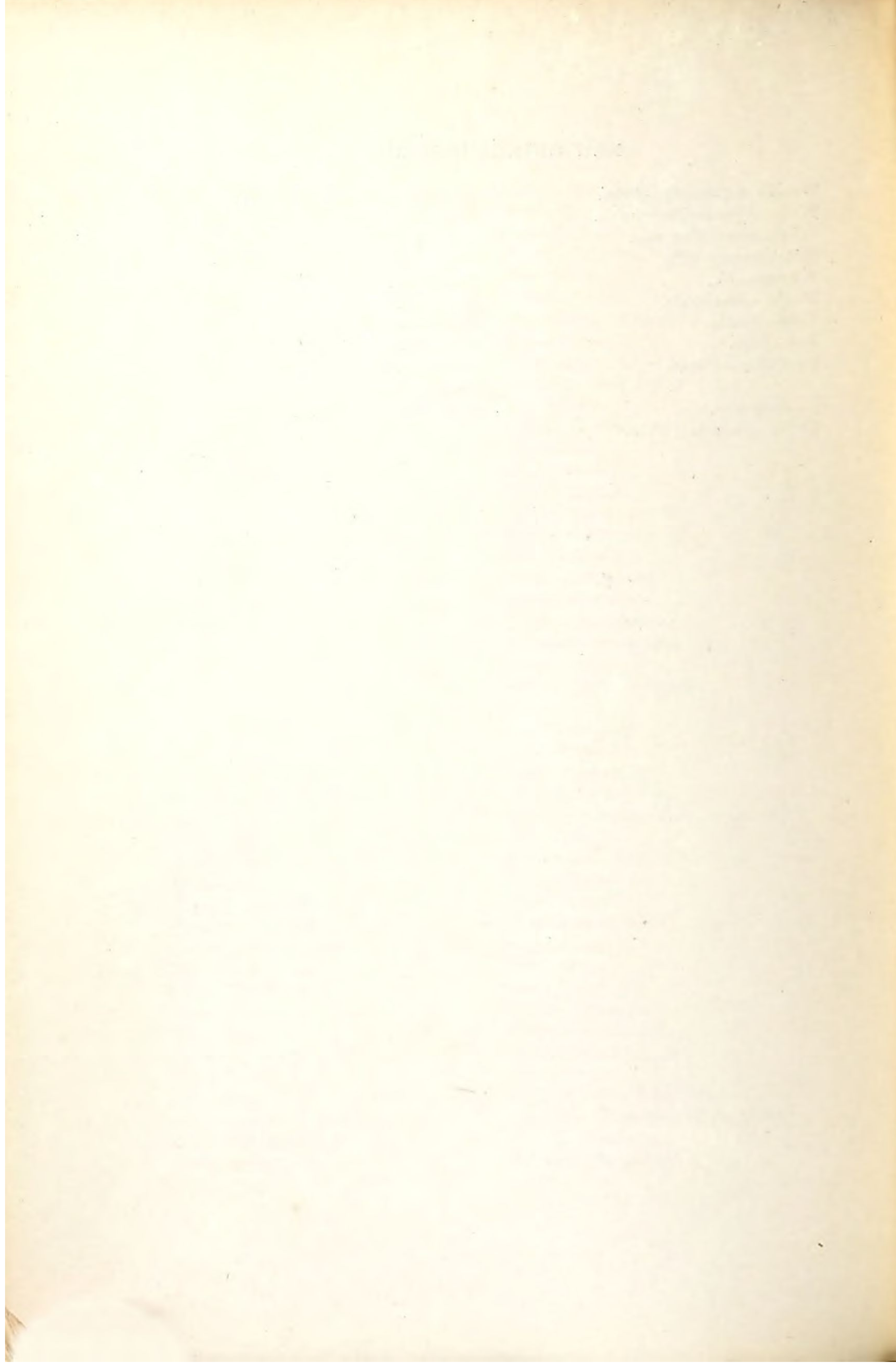
His—*Areve*.

Ours—*Erave erita*.

Yours—*Eve*.

Theirs—*Areo*.

Each—*Farakeka farakeka*.



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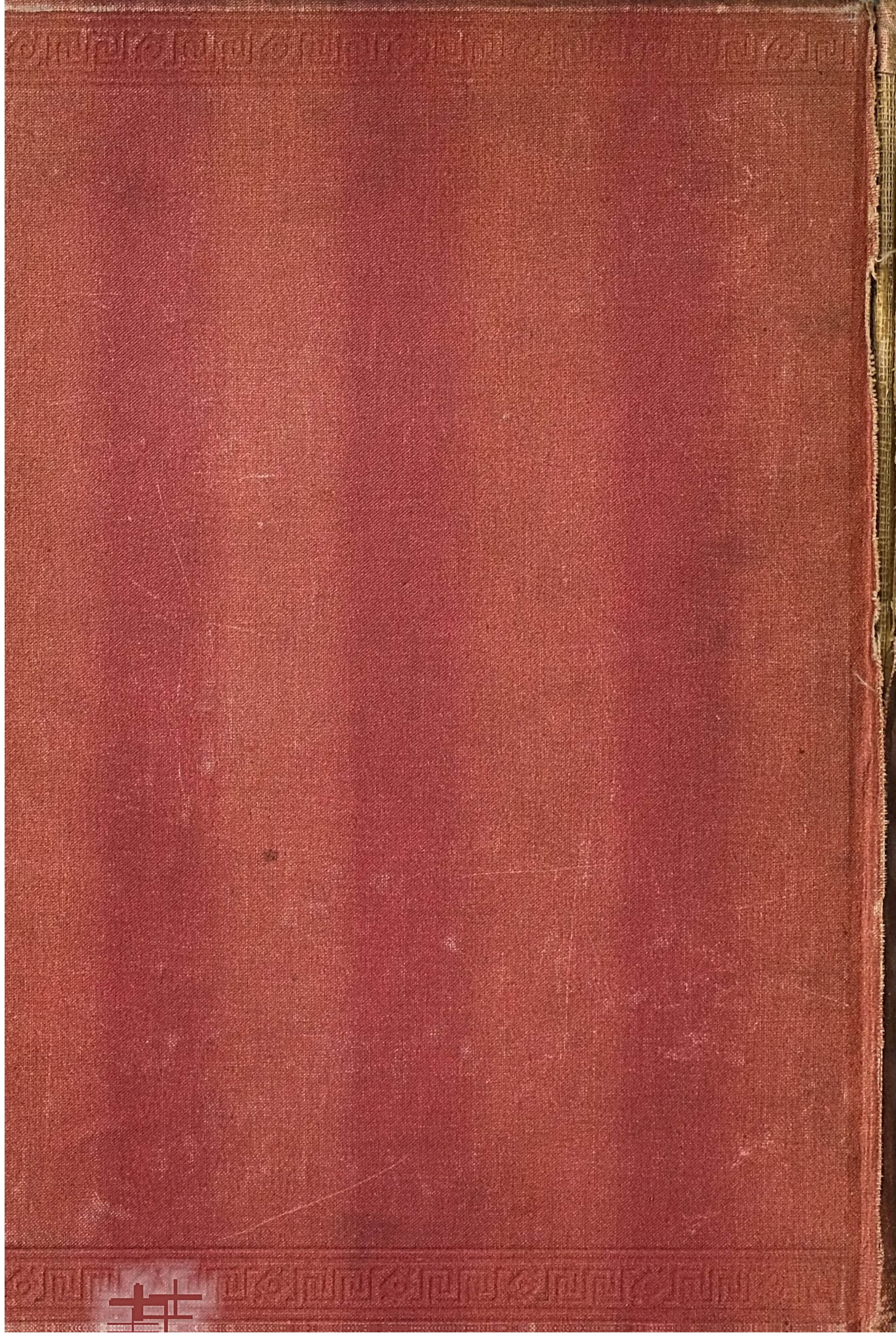
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